# FRYINGPAN-ARKANSAS PROJECT, COLO.

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# HEARINGS

BEFORE THE

## SUBCOMMITTEE ON IRRIGATION AND RECLAMATION

OF THE

## COMMITTEE ON INTERIOR AND INSULAR AFFAIRS UNITED STATES SENATE

EIGHTY-THIRD CONGRESS

FIRST SESSION

ON

## S. 964

A BILL TO AUTHORIZE THE CONSTRUCTION, OPERATION, AND MAINTENANCE BY THE SECRETARY OF THE INTERIOR OF THE FRYINGPAN-ARKANSAS PROJECT, COLORADO

JUNE 15 AND 16, 1953

Printed for the use of the Committee on Interior and Insular Affairs

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# CONTENTS


| | Page |
|---|---|
| Text of S. 964 | 1 |
| Statement of— | |
| Aandahl, Hon. Fred. G., Assistant Secretary of the Interior, accompanied by George E. Tomlinson, Assistant Director of Project Planning, Bureau of Reclamation, Department of the Interior | 68 |
| Amend, Lewis E., Rocky Ford, Colo | 288 |
| Andrus, Milton H., Pueblo, Colo | 312 |
| Barnes, Harry, Rocky Ford, Colo | 314 |
| Beaty, John W., Manzanola, Colo | 316 |
| Beise, Charles J., attorney at law, Denver, Colo | 88 |
| Breitenstein, Jean S., attorney at law, Denver, Colo., representing Colorado Water Conservation Board | 173, 242 |
| Chenoweth, Hon. J. Edgar, a Representative in Congress from the State of Colorado | 63 |
| Christy, Harold H., Pueblo, Colo | 140 |
| Cooper, Roy D., Las Animas, Colo | 161 |
| Ducy, Damian, President, Water Development Association of Southeastern Colorado | 300 |
| Ely, Northcutt, special counsel, Colorado River Board of California | 227 |
| Everett, George E., Salida, Colo | 309 |
| Gardner, Harper, Pueblo Water Works, Pueblo, Colo | 307 |
| Hunter, Dan B., president, Southwestern Conservation District, Dove Creek, Colo | 133 |
| Johnson, Hon. Edwin C., United States Senator from the State of Colorado | 55 |
| Matthew, Raymond, chief engineer, Colorado River Board of California | 220 |
| McBroom, James T., coordinator, office of river basin studies, Fish and Wildlife Service, Department of the Interior | 294 |
| Morrison, Jack P., Pueblo, Colo., representing organized labor, State of Colorado | 137 |
| Patterson, L. R., assistant to the vice president in charge of electric operations, Public Service Co. of Colorado, Denver, Colo | 247 |
| Powell, Ben F., area engineer, Bureau of Reclamation, Pueblo, Colo | 113 |
| Reese, Harry C., La Junta, Colo | 309 |
| Ryan, Ted R., Rocky Ford, Colo | 166 |
| Tipton, Royce J., consulting engineer, Denver, Colo | 201 |
| Will, John Geoffrey, secretary and general counsel, Upper Colorado River Commission | 244 |
| Additional information supplied for the record by— | |
| Adams, Alva B., Pueblo, Colo.: petition | 337 |
| Allen, Arthur L., Pueblo, Colo.: petition | 337 |
| Amend, Lewis A., Rocky Ford, Colo.: petitions | 337 |
| Babcock, George T., Rocky Ford, Colo.: petition | 337 |
| Berry, W. T., Canon City, Colo.: petition | 337 |
| Brotherhood of Railroad Trainmen: resolution | 335 |
| Bullen, Joseph R., Pueblo, Colo.: petition | 337 |
| Chaffee County, Colo., resolution | 344 |
| Chamber of Commerce of— | |
| Buena Vista, Colo.: resolution | 320 |
| Canon City, Colo.: resolution | 320 |
| Colorado Springs, Colo.: resolution | 318 |
| Fads, Colo., letter of Levi Rutledge, to Chairman, May 7, 1953 | 343 |
| Florence, Colo.: resolution | 321 |
| Fowler, Colo.: resolution | 321 |
| Huerfano County, Colo.: resolution | 319, 321 |
| La Junta, Colo.: resolution | 319 |
| Pueblo, Colo.: resolution | 318 |
| Salida, Colo.: resolution | 319 |

Additional information supplied for the record by—Continued Page
Chelf, L. Marion, Canon City, Colo.: petition 337
Christy, Harold H.:
Letter to Hon. Eugene D. Millikin, June 16, 1953 346
Petition 337
City of—
Buena Vista, Colo.: resolution 342
Canon City, Colo.: resolution 341
Colorado Springs, Colo.: resolution 338
Eads, Colo.: resolution 343
Florence, Colo.: resolution 341
Fowler, Colo.: resolution 342
La Junta, Colo.: resolution 343
Las Animas, Colo.: resolution 340
Leadville, Colo.: resolution 344
Manzanola, Colo.: petition 341
Poncha Springs, Colo.: resolution 339
Pueblo, Colo.: resolution 337
Rocky Ford, Colo.: petition 343
Salida, Colo.: petition 338
Swink, Colo.: petition 341
Walsenburg, Colo.: petition 339
Colorado River Board of California: Supplemental statement of Northcutt Ely 232
Colorado State Federation of Labor: resolutions 336
Colorado State Industrial Union Council: resolution 336
Colorado, State of: telegram from Governor Dan Thornton 54
Colorado Water Conservation Board:
Bill No. 457 194
Extract from minutes of July 24, 1951, meeting of the Arkansas River Compact Administration 195
Minutes of meeting of February 22, 1951:
Excerpts 186
Official comments and recommendations 176
Prepared statement of Jean S. Breitenstein 197
Congress of Industrial Relations: resolution 336
Cooze, W. H.: telegram to Hon. Eugene D. Millikin, June 13, 1953 345
Cosant, G. S., La Junta, Colo.: petition 337
Divens, Smith E., Fowler, Colo.: petition 337
Ducy, D. P., Pueblo, Colo.: petition 337
Elks Lodge of—
La Junta, Colo.: resolution 331
Pueblo, Colo.: resolution 331
Walsenburg, Colo.: resolution 331
Emmons, H. G., Pueblo, Colo.: petition 337
Fabrizio, J. J., Florence, Colo.: petition 337
Farmers Luncheon Club, Colorado Springs, Colo.: resolution 323
Fort Lyon Canal Co.:
Maps showing location and names of operators on farms Facing 166
Resolution 322
Table re Fort Lyon Canal system 163
Fountain Mutual Irrigation Co.: resolution 323
Hardy, Don, Canyon City, Colo.: petition 337
Henry, Frederick T., Colorado Springs, Colo.: petition 337
Hoag, Frank S., Pueblo, Colo.: petition 337
Hoag, Frank S., Jr., Pueblo, Colo.: petition 337
Hoge, W. R., Pueblo, Colo.: petition 337
Huerfano Post, American Legion No. 16, Huerfano, Colo.: resolution 333
Hyer, D. B., Jr., Pueblo, Colo.: petition 337
Interior, Department of:
Contract with Public Service Company of Colorado for transmission service 271
Letter from the Secretary to the Vice President, June 9, 1953, with the following enclosures:
Letter to the Secretary from the Bureau of the Budget, June 8, 1953 23
Secretary McKay's report to the President, through Bureau of the Budget, April 30, 1953 25

Additional information supplied for the record by—Continued
Interior, Department of—Continued
Letter from the Secretary, etc.—Continued Page
Former Secretary Chapman's report to the President, October 19, 1951 34
Report of the Commissioner of Reclamation, dated September 11, 1951, and approved by the Secretary, October 19, 1951 34
Proposed report of the Commissioner of Reclamation dated April 16, 1951, and approved by the Secretary, May 4, 1951 20
Report of the Regional Director, Bureau of Reclamation, revised February 23, 1951 2
Comments:
Governor of Arizona, August 28, 1951 35
California Department of Public Works, August 27, 1951 36
Colorado Water Conservation Board, August 7, 1951 39
Governor of Kansas, August 2, 1951 45
Utah State Engineer, June 5, 1951 46
Wyoming Natural Resources Board, June 11, 1951 46
Chief of Engineers, Department of the Army, September 26, 1951 47
Department of Agriculture, October 10, 1951, May 23, 1952 48
Department of Commerce, July 30, 1951 50
Federal Power Commission, August 22, 1951 51
Public Health Service, Federal Security Agency, August 16, 1951 53
Letter from G. W. Lineweaver, Assistant Commissioner, to Hon. John R. Pillion, June 12, 1953, re specific municipal water costs 118
Prepared statment of Ben F. Powell, area engineer, Pueblo, Colo 128
Report of the Bureau of the Budget 54
Supplement to Senate Document 106, 82d Congress 104
Summary of the effect of the project on the water supply of Colorado Springs 85
Table showing—
Charges for municipal water 80
Estimated costs of municipal water on the projected Fryingpan–Arkansas project 81
Irrigation indebtedness of the canal companies in Fryingpan-Arkansas project area 72
Water charges for selected reclamation projects 74
International Brotherhood of Electrical Workers: Statement of Jack P. Morrison 138
Izaak Walton League:
Resolution 345
Telegram from J. W. Penfold, western representative, to Hon. Eugene D. Milliken, June 16, 1953 345
Johnson, Hon. Edwin C.: Telegram from W. H. Cooze and Ed McCabe
Junior Chamber of Commerce of—
Pueblo, Colo.: resolution 322
Rocky Ford, Colo.: resolution 322
Kenyon, J. A., Pueblo, Colo.: petition 337
League of Business and Professional Women: resolution 332
Lions Club of—
Buena Vista, Colo.: resolution 328
Canon City, Colo.: resolution 328
Fowler, Colo.: resolution 329
La Junta, Colo.: resolution 329
Leadville, Colo.: resolution 330
Ordway, Colo.: resolution 329
Rocky Ford, Colo.: resolution 329
Salida, Colo.: resolution 327
Mathis, W. T., Pueblo, Colo: petition 337
McCabe, Ed.: telegram to chairman, June 13, 1953 345
Mendenhall, H. B., Rocky Ford, Colo.: petition 337
Muir, Hugh, Florence, Colo.: petition 337
Person, R., Pueblo, Colo.: petition 337

Additional information supplied for the record by—Continued Page
Poncha Springs Booster Club, Poncha Springs, Colo.: resolution ..... 333
Public Service Co. of Colorado:
Prepared statement ..... 247
Proposal ..... 250, 268
Pueblo Area Credit Union Chapter, Pueblo, Colo.: resolution ..... 334
Pueblo Board of Realtors, Pueblo, Colo.: resolution ..... 334
Pueblo Building Trades Council, resolution ..... 336
Pueblo Game and Fish Association, Pueblo, Colo.: resolution ..... 332
Pueblo trades and labor assembly, resolution ..... 335
Pueblo United Labor League, Pueblo, Colo.: resolution ..... 334
Rotary Club of—
Canon City, Colo.: resolution ..... 325
La Junta, Colo.: resolution ..... 325
Pueblo, Colo.: resolution ..... 324
Rocky Ford, Colo.: resolution ..... 325
Salida, Colo.: resolution ..... 326
Walsenburg, Colo.: resolution ..... 325
Salida Flying and Civic Club, Salida, Colo.: resolution ..... 332
Sangre De Christo Power Co.: table ..... 292
San Isabel Power Co.: table ..... 292
San Luis Valley Rural Electric Cooperative, Inc.: resolution ..... 327
Scribner, S. C., Pueblo, Colo.: petition ..... 337
Southeast Colorado Power Association, resolution ..... 326
Southeastern Colorado Soil Conservation Association ..... 324
Southeastern Power Co.: resolution ..... 326
Southern Colorado Power Co.:
Prepared statement ..... 248
Proposal ..... 268
Southwestern Conservation District, Dove Creek, Colo.: Prepared statement of Dan B. Hunter, president ..... 135
Suroh, Ralph, Colorado Springs, Colo.: petition ..... 337
Swanson, T. C., Pueblo, Colo.: petition ..... 337
United Steelworkers of America, CIO: Statements of Earl P. Law and George J. White ..... 138, 139
Upper Arkansas Soil Conservation District: resolution ..... 324
Water Development Association of Southeastern Colorado:
Resolution ..... 344
Statements of Charles J. Beise, counsel, and Harold H. Christy, director ..... 89
Williamson, Marc G., Pueblo, Colo.: petition ..... 337
Willis, W. A., Pueblo, Colo.: petition ..... 337
Young, Ira K., Pueblo, Colo.: petition ..... 337

# FRYINGPAN-ARKANSAS PROJECT, COLORADO

**MONDAY, JUNE 15 1953**

UNITED STATES SENATE,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
*Washington, D. C.*

The subcommittee met, pursuant to call, at 10:35 a. m., in room 224, Senate Office Building, Senator Eugene D. Millikin, Colorado (chairman of the subcommittee), presiding.

Present: Senators Hugh Butler, Nebraska (chairman); Eugene D. Millikin, Colorado; Guy Cordon, Oregon; Clinton P. Anderson, New Mexico; and Henry M. Jackson, Washington.

Also present: Kirkley S. Coulter, chief clerk; N. D. McSherry, assistant chief clerk; and Elmer K. Nelson, consulting engineer.

Senator MILLIKIN. This is a hearing on S. 964 jointly sponsored by the senior and junior Senators from Colorado. It is a bill to authorize construction, operation, and maintenance by the Secretary of the Interior of the Fryingpan-Arkansas project, Colorado.

The record will show the bill and the report of the Department of the Interior.

(The bill and report referred to follow:)

[S. 964, 83d Cong., 1st sess.]

A BILL To authorize the construction, operation, and maintenance by the Secretary of the Interior of the Fryingpan-Arkansas project, Colorado

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.* That, for the purpose of supplying water for irrigation, municipal, domestic, and industrial uses, generating and transmitting hydroelectric power and energy, controlling floods, providing for the preservation and propagation of fish and wildlife and preserving and improving recreational opportunities, and for other useful and beneficial purposes, the Secretary of the Interior, acting pursuant to the Federal reclamation laws, Act of June 17, 1902 (32 Stat. 388), and Acts amendatory thereof or supplementary thereto, as far as those laws are not inconsistent with the provisions of this Act, and subject to the apportionments of the use of water fixed in the Colorado River Compact and the Upper Colorado River Basin Compact and to the terms of the Boulder Canyon Project Act, and to the terms of the United States-Mexico Water Treaty of 1944 (Treaty Series 994), is hereby authorized to construct, operate, and maintain the Fryingpan-Arkansas project, Colorado, in substantial accordance with the engineering plans therefor set forth in Senate Document Numbered 106, Eighty-second Congress, second session, but with such modifications of, omissions from, or additions to the works therein described as the Secretary may, from time to time, find necessary or proper for accomplishing the objectives of the project, and in accordance, also, with recommendations lettered E to K, inclusive, set forth on pages 25 and 26 of that document.

SEC. 2. The Secretary of the Interior may appoint the two representatives of the United States to the Commission referred to in paragraph 17, page numbered 23, Senate Document Numbered 106, Eighty-second Congress, second session, and may adopt modifications of the operating principles therein referred to upon the recommendations of the Commission: *Provided*, That such recommendations

are made and adopted by said Commission in conformity to the provisions of paragraph 17 of said operating principles set forth on page 23 of Senate Document Numbered 106, Eighty-second Congress, second session.

SEC. 3. Any and all benefits and rights of western Colorado water users in and to water stored in the Green Mountain Reservoir, Colorado-Big Thompson project, as described, set forth and defined in Senate Document Numbered 80, Seventy-fifth Congress, first session, shall not be impaired, prejudiced, abrogated, nullified, or diminished in any manner whatever by reason of the authorization, construction, operation, and maintenance of the Fryingpan-Arkansas project authorized by this Act.

SEC. 4. Any provision of law to the contrary notwithstanding, the project herein authorized shall be operated in such a manner that those in eastern Colorado using project water imported from the Colorado River Basin for domestic purposes shall have preference over those claiming or using the water for any other purpose.

SEC. 5. The Secretary is authorized to plan, construct, operate, and maintain public recreational facilities on lands withdrawn or acquired for the development of the Fryingpan-Arkansas project, to conserve the scenery, the natural, historic, and archeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects by such means as are consistent with the primary purposes of said project and to mitigate losses of and improve conditions for the propagation of fish and wildlife in connection with the development of the Fryingpan-Arkansas project. The Secretary is authorized to acquire lands and to withdraw public lands from entry or other disposition under the public land laws for the construction, operation, and maintenance of recreational facilities in connection with the said project, and to dispose of them to Federal, State, and local governmental agencies by lease, transfer, exchange, or conveyance, upon such terms and conditions as will best promote their development and operation in the public interest. The costs, including the operation and maintenance costs of all said undertakings shall be nonreimbursable and nonreturnable under the reclamation laws, and funds appropriated for carrying out the authorization contained in section 1 of this Act shall, without prejudice to the availability of other appropriated moneys for the same purpose, also be available for carrying out the investigations and programs authorized in this section.

SEC. 6. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be necessary to carry out the purposes of this Act and, in addition thereto, such further sums as may be necessary for the continued investigation, as set forth in Recommendation M, page 26, Senate Document Numbered 106, Eighty-second Congress, second session, of a comprehensive plan of development of the Upper Arkansas River Basin.

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DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
REGIONAL OFFICE, REGION 7,
*Denver, Colo., July 5, 1950.*
(Revised February 23, 1951.)

To: The Commissioner, Bureau of Reclamation.
From: The Regional Director, Region 7, Denver, Colo.
Subject: [1] Report on the Initial Development, Roaring Fork Diversion, of the Gunnison-Arkansas Project, Colorado.

## TRANSMITTAL AND AUTHORITY

1. This is my report on the initial development, Roaring Fork diversion, of the potential Gunnison-Arkansas project, Colorado. The initial development, a multiple-purpose project involving transmountain diversion of water, is designed as a major step in optimum utilization of water and related resources in the upper Arkansas River Basin. The report and substantiating documents are submitted for your approval and for departmental action with a view toward securing congressional authorization for development of the project.

2. Authority to make this report and supporting investigations is provided in the Federal reclamation laws (act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof or supplementary thereto).

[1] "Initial Development, Roaring Fork Diversion, of the Gunnison-Arkansas Project, Colorado" was the original name used for project when the project report was prepared. It is now proposed to change the name of the project to the "Fryingpan-Arkansas Project."

## INTRODUCTION

3. From its origin on the snowcapped mountains of Lake County, Colo., the Arkansas River (pronounced Ar-kan-saw) flows eastward 1,500 miles to its confluence with the Mississippi. The river's drainage from the Continental Divide to Ellinwood, Kans., comprises the upper Arkansas River Basin. The economy of that semiarid section of the Nation is bound closely to its natural resources. Their conservation and development are essential if the economy of the basin is to be stabilized and expanded. Water is the key resource and its utilization for all beneficial purposes is of prime importance. The Arkansas River is the hydrologic artery of the basin. It furnishes municipal water, industrial water, and irrigation water. The behavior and the yield of the river are, therefore, of concern to all interested in irrigation agriculture, in the protection and expansion of business investments, and in the wise and orderly development of the resources of the basin.

4. The potential Gunnison-Arkansas project is a major unit in the comprehensive plan of development of the water resources of the upper Arkansas River Basin which is being investigated by the Bureau of Reclamation. The project is adaptable to construction by successive cumulative stages. The initial development is planned as a completely independent multiple-purpose unit that could be the first stage of a much larger project. The comprehensive project would require exportation of a relatively large amount of Colorado River water eastward through the Continental Divide to the Arkansas Valley of Colorado. The full potential uses of water in western Colorado have not been completely determined; therefore, only the amount of water assuredly beyond the requirements for development on the western slope is proposed for diversion at this time.

5. This report and attached substantiating report have been sponsored and prepared by the Bureau of Reclamation for the United States Department of the Interior. All agencies of the Department concerned with the development and administration of resources in the project area have made important contributions. Other Federal agencies, numerous State and local governmental agencies, water districts, civic organizations, corporate enterprises, and private individuals have given substantial aid in the development of the report. Preliminary drafts of the report were furnished to the States of Colorado and Kansas, and to the field offices of affected Federal agencies. These drafts were reviewed by the two States and at field level by the following agencies:

Department of Agriculture:
- Forest Service
- Soil Conservation Service

Department of the Army, Corps of Engineers
Federal Power Commission
Department of the Interior:
- Bureau of Mines
- Bureau of Land Management
- Fish and Wildlife Service
- Geological Survey
- National Park Service

## DESCRIPTION OF AREA

6. *Physical features.*—Two distinct areas are involved in the project. They are separated by the Continental Divide which exceeds an altitude of 12,000 feet. The western slope diversion area, where transmountain water would be obtained, is located in the Roaring Fork River Basin of the Colorado River drainage. Water would be diverted from tributaries of the Fryingpan River and from Hunter Creek—both tributaries of the Roaring Fork. The diversion area is mountainous and primitive. It is located within the boundaries of the White River National Forest at elevations above 10,000 feet. Most of the 100-square-mile area is accessible only by trails.

7. The eastern slope project area extends from the headwaters of the Arkansas River, near Leadville, to the Colorado-Kansas boundary. The upper reaches of the Arkansas Valley are as rugged as the diversion area. The Rocky Mountains reach their highest elevation near Leadville at Mount Elbert, 14,431 feet above sea level. Close by are Mount Massive, 14,419 feet, and Mount Harvard, 14,399 feet. Elbert and Massive are the second and third highest peaks in the continental United States. Originating high above timberline, the Arkansas River flows south and east—successively through canyons and foothills to the gently

rolling high plains. Approximately 38 percent of the eastern slope project area is below an altitude of 5,000 feet, relatively level, and suitable for farming.

8. *Climate.*—The project area has a range of climate from subhumid in the high mountains to semiarid in the lower altitudes. On the western slope, the village of Nast, located just below the diversion area at an altitude of 8,800 feet, has a mean annual precipitation of 17.86 inches, an average temperature of 36.6° F., and a frost-free period averaging only 66 days. Corresponding data for representative weather stations on the eastern slope are—

| Station | Altitude | Precipitation (inches) | Temperature (° F.) | Frost-free period (days) |
|---|---|---|---|---|
| Leadville | 10,182 | 18.63 | 35.6 | 83 |
| Canon City | 5,343 | 12.98 | 53.4 | 168 |
| Pueblo | 4,808 | 11.67 | 52.0 | 173 |
| Rocky Ford | 4,117 | 12.30 | 52.1 | 165 |
| Lamar | 3,615 | 16.05 | 54.4 | 168 |

9. *Population.*—Unofficial estimates place the population of the upper Roaring Rork River Basin at about 1,000 permanent residents. Aspen, the largest community, had a population of 777 in 1940. Other residents live on raches or at resorts or in the smaller villages. Few, if any, persons live in the diversion area proper.

10. The population of the eastern slope project area reached 278,000 in 1940. Unofficial local estimates placed the 1948 population at 362,000—a 35-percent increase over 1940. Preliminary unofficial returns of the 1950 census disclose that Peublo's 1940 population of 52,162 had increased to 63,561 and Colorado Springs' population from 36,789 to 45,269. Other sizable communities in the valley and their 1940 populations are Leadville, 4,774; Salida, 4,969; Canon City, 6,690; La Junta, 7,040; and Lamar, 4,465.

11. *Present development.*—Livestock ranching and the recreational industry are the principal business activities in the upper Roaring Fork Basin. In times past, mining was extensive. This activity had diminished but the latent industry may be revived. Registered Hereford cattle from the western slope have received national recognition. Winter sports, vacationing, and sport fishing are becoming increasingly important throughout the basin. The diversion area proper has no farming although the forest is used for grazing.

12. The upper part of the Arkansas Valley is similar in many respects to the upper Roaring Fork Basin. Mining is important at and near Leadville and winter and summer sports bring many persons to the area. The city of Pueblo is the focal center for the varied industrial development of the valley. The most important industrial enterprises, based upon the 1939 census of business, included 1 steel mill, a cement plant, smelters, iron foundries, brick and tile plants, machine shops, and agricultural processing plants, including 23 grain elevators, 3 flour mills, 8 feed grinding and mixing plants, 9 alfalfa mills, 4 meat packing plants, 3 beet sugar factories, and 5 canning plants.

13. Agriculture, however, is the most important industry of the valley. More than 87 percent of the land area, including timberland, is used for grazing. Cultivated lands comprise 10 percent of the area of which about one-fourth, or 322,000 acres, is irrigated. The irrigated land exerts an extremely significant influence on the economy of the valley. It stabilizes the economy of an area many times greater than that actually irrigated.

14. Many irrigated crops are grown successfully in the Arkansas Valley when water supplies are adequate. In the higher elevations hay, tame pasture, and small grains predominate. They are marketed chiefly through livestock. The foothills area in Fremont and Pueblo Counties, in addition to general irrigated crops, produce fruits, vine, and truck crops. Below Pueblo the principal irrigated crops are alfalfa, corn, grain sorghum, sugar beets, barley and wheat, truck crops, and dry beans. Cantaloups, onions, cucumbers, pickles, tomatoes, and red beets are highly successful truck crops. Dairying and poultry raising are important enterprises near market outlets.

15. The size of irrigated farms varies from small truck farms and orchards to general purpose farms of several hundred acres. In 1940 the average irrigated farm below Salida consisted of 356 acres of which 81 acres were irrigated. Irrigated land values range up to $250-an acre depending upon soils and water rights. Gross crop values also vary considerably. On the basis of 1939–44 crop prices,

the average irrigated gross crop values ranged from $30 to $40 an acre over the critical 1930–41 period. Specialty crops and seed crops often provide gross returns many times the average.

16. Ninety-six percent of the irrigated land in the Arkansas Valley is identified as classes 1 and 2 according to Bureau of Reclamation standards. It is of high to medium productive capacity; consists of silty loam, clay loam, and clay soils; and generally has good surface drainage. Alkalinity and salinity are not serious problems.

NEED FOR DEVELOPMENT

17. The western slope diversion area proper is national-forest land not suitable for irrigation. Other areas in the Colorado River Basin have irrigated and irrigable lands. Present water uses in western Colorado will undoubtedly expand and new uses may materialize. The increased uses may result from expansion of irrigation and from such potential industrial developments as mining, lumbering, wood-pulp production, and oil-shale refining. Investigations of the Gunnison-Arkansas project were based upon the principle that all present and potential uses of Colorado River water in the natural basin in Colorado must be protected. Extensive studies by the Bureau and by committees appointed by the Colorado Water Conservation Board confirm the existence of a plentiful supply of water in the diversion area. The studies also substantiate the conclusion that part of that water can feasibly be diverted without detriment to the diversion area or to other existing and potential water uses on the western slope—even though complete future water requirements for all possible uses cannot be foreseen for all of western Colorado. The relatively small diversions proposed for the initial development—replaced in time, quantity, and place by a reservoir near Aspen and by judicious operation of the project based on the operating principles hereinafter set forth—will not impair the future economic growth of the western slope, harm present water users, or create a risk in meeting the Lee Ferry obligation of the Colorado River compact.

18. *Irrigation.*—The main agricultural part of the eastern slope project area is in the semiarid zone of 11 to 16 inches of annual precipitation. Seventy to eighty-six percent falls during the April to October growing season. Dry farming is and probably will continue to be practiced extensively. Livestock grazing on the ranges and in the forests is also an extensive enterprise. However, both types of agriculture require large land areas, and dry farming particularly depends upon the vagaries of the weather. General cultivated agriculture and specialty high-value crops, many of which are required to stabilize the agricultural economy of the area, require more water than typical dryland crops. Irrigation is the only means of providing a dependable supply.

19. Early irrigation in the Arkansas Valley coincided with available stream runoff. As ready markets developed, irrigation farming was expanded and a demand developed for late-season water which could not be supplied by unregulated streamflow. Consequently, between 1890 and 1910, three reservoirs in the headwaters area and 11 offstream reservoirs below Pueblo were constructed. In 1949 the John Martin Reservoir on the Arkansas River was completed by the Corps of Engineers for conservation storage and flood control. It also has an irrigation storage space of 420,000 acre-feet. The three headwaters reservoirs have a capacity of 84,400 acre-feet. The 11 off-stream reservoirs have a present capacity of 300,000 acre-feet which represents about 75 percent of the original capacity as a consequence of sedimentation. Eight privately owned transmountain diversion systems import about 48,000 acre-feet annually.

20. More than 40 canals and ditches supply irrigation water to lands in the valley between Canon City and the Colorado-Kansas boundary. Sediment deposition in canals and ditches has become a major irrigation problem in the Pueblo-Las Animas reach. In some instances long reservoir feeder canals have lost 50 percent of their capacity because of sedimentation.

21. The amount of irrigation water available for the 322,000 acres of irrigated land in the project area varies considerably from year to year. Seldom is the supply adequate for maximum crop production. Irrigation water shortages as high as 78 percent of drop requirements have occurred. The estimated average canal headgate diversion requirement is 3.19 acre-feet an acre. Allowing for tolerable shortages, that headgate requirement can be reduced to 3.10 acre-feet. The average amount of seasonal irrigation water historically available between Pueblo and the Kansas State line has ranged from 0.9 acre-feet an acre in 1934 to 2.7 acre-feet in 1942. The base flow of every stream in the valley is overappropriated. Enhancement of the irrigation water supply depends upon regula-

tion of existing supplies for more efficient use, additional storage capacity for the conservation of excess flood flows, reservoir space for holdover storage, and new water supplies for which the only apparent source is transmountain diversion from the Colorado River drainage.

22. *Power.*—Power facilities of the initial development will be designed for integration with the power facilities of the Bureau's Colorado-Big Thompson project and with local utilities to serve a combined power market area. The combined area, which consists of the entire eastern slope of Colorado and Grand and Summit Counties on the western slope, comprises roughly two-thirds of the State and contains a large majority of the State's population and industries. The area is served with electricity by 15 private utilities, 25 municipal organizations, 11 REA cooperatives, and the Bureau of Reclamation. Although not considered a permanent part of the power market area, loads in the vicinity of Gunnison and Saguache may be served originally by the initial development because of their proximity to the project power system. The Colorado-Big Thompson project has, among other features, the 21,600-kilowatt Green Mountain hydroelectric plant now in operation on the western slope, and, when completed, will also have hydroelectric plants on the eastern slope north of Denver.

23. In December 1948—the latest year of complete record—installed generating capacity in the combined power market area totaled 347,105 kilowatts. Of that total, 339,000 kilowatts were dependable capacity. Only about 20 percent of the installed capacity was hydropower. Steam capacity comprised 73 percent. A number of industrial plants in the area have their own generating systems which, combined, have an installed capacity of about 85,000 kilowatts.

24. The noncoincident peak demand for power in the market area in 1948 reached 300,000 kilowatts—about 12 percent more than the net assured capacity of 267,000 kilowatts. Forecasts indicate that the dependable capacity requirements will be about 632,000 kilowatts by 1960 and 966,000 kilowatts by 1970. On the basis of 1948 installations, plus all known additions scheduled or projected, less normal or necessary retirements, the market area will still have a deficiency in power supply.

25. As of 1950, eastern Colorado does not have a high-voltage transmission system interconnecting all important load centers. Ties of utilities to enable interchange of power are essential for maximum efficiency of service and utilization.

26. *Municipal water.*—Most of the Arkansas Valley towns below Pueblo obtain municipal water from pumped wells. Other valley communities use water from streams and springs. In general, the quality is poor because of excessive hardness.

27. Colorado Springs obtains excellent water from the slopes of Pikes Peak. The city experienced water shortages prior to 1937. Since then, its water storage capacity has been doubled and all service connections have been metered. The city has indicated an urgent need of 4,000 acre-feet of supplemental municipal water immediately and a probable need for an additional 16,000 acre-feet by the year 2000. In 1949, Colorado Springs started drilling the Hoosier pass transmountain diversion tunnel which would import western slope water from the Blue River. The city has expressed interest in obtaining supplemental municipal water from the initial development by exchange methods.

28. Pueblo obtains its municipal water from the Arkansas River. During periods of low flows the water is of poor quality. The water is relatively hard and unpalatable. In 1938, Pueblo acquired the Wurtz ditch which imports annually about 2,000 acre-feet of water from the western slope. Much of the yield from that transmountain project is lost to municipal use for lack of storage space. The city has indicated an immediate need for 5,000 acre-feet of municipal water (including the 2,000 acre-feet of Wurtz ditch water) and an ultimate additional need of 15,000 acre-feet by the year 2000. The city has also expressed interest in obtaining treatment of its present supply of 21,000 acre-feet.

29. Canon City and Rocky Ford obtain municipal water from the Arkansas River. Canon City has not requested project water.

30. The towns of Manzanola, Rocky Ford, La Junta, Las Animas, and Lamar, and the off-stream towns of Crowley, Wiley, and Eads have requested treated municipal water from the project to replace entirely their present supplies. Their immediate needs are about 8,000 acre-feet.

31. *Flood control.*—Few damaging floods of record have occurred in the diversion area and in the Arkansas Valley down to Canon City. From there eastward, however, damaging floods increase in frequency and volume to the mouth of the Purgatoire River. The largest flood of record in the project area occurred in June 1921. Intense rains caused flows at Pueblo estimated at 103,000 second-

feet. Downstream tributaries contributed to the flood until the peak of 200,000 second-feet was reached at La Junta. The flood killed at least 78 persons; property damages exceeded $19,000,000, including $10,000,000 in Pueblo

32. As a result of that disastrous flood, a barrier dam across the Arkansas River, 6 miles west of Pueblo, and an improved floodway channel through the city were completed in 1926. Another flood-control structure, the John Martin Reservoir, located on the Arkansas River near Lamar, Colo., was completed in 1949 by the Corps of Engineers. A multiple-purpose project, 281,000 acre-feet of its 701,000 acre-foot capacity are allocated to flood control.

33. A flood danger still exists from Pueblo downstream to the John Martin Reservoir. The Corps of Engineers has estimated that the annual damages along that reach of the river average $890,000. The initial development could eliminate about 66 percent of that probable damage.

34. *Associated needs.*—Sediment control, stream pollution abatement, enhancement of the environment for fish and wildlife, and provision for recreation are other needs of the project area associated with water development. Industrial expansion, conservation of forest and range lands, and stabilization of the entire economy by balanced diversification of interest are recognized as long-range objectives. The initial development could immediately ameliorate some of the problems stemming from those needs. Resolution of the long-range objectives will require coordinated and unselfish cooperation by all citizens, agencies, and entities concerned.

35. Mention has already been made of the acute sedimentation problem affecting irrigation in the main Arkansas Valley. At Pueblo the river annually transports about 944 acre-feet of sediment. Approximately 42 percent of that sediment is deposited in reservoirs, canals, and laterals; about 38 percent becomes undesired deposition on the irrigated lands. Aggradation of the river channel has made some irrigation diversion structures inoperative; other diversion structures have necessarily been raised. Removed sediment now lines some canal banks and further disposal has become very expensive. Canal sand traps have become inoperative. The only apparent immediate solution is provision of reservoir space specifically for the deposition of sediment.

36. Stream pollution has not reached dangerous or serious proportions in the Arkansas Valley. The most noticeable effects of industrial pollution are found below Leadville as a result of mine drainage and tailings.

37. Fishing is a summer sport of considerable financial significance in the diversion area and in the upper Arkansas Valley. The Fish and Wildlife Service has prepared a preliminary report on the subject and has made tentative recommendations concerning minimum flows needed to preserve fishery values in the diversion area. The project has been so planned and operating rules have been so formulated as to prevent the diversion of water which would reduce the flows below the specified minimum. Continued studies of the requirements of the fishery resources are needed to develop refinements under the terms of the operating rules.

38. The mountainous portions of both slopes of the project area—and especially the diversion area—combine such desirable qualities as scenic attractiveness, wilderness character, remoteness, water for fishing, and skiing facilities. Consequently, they are important recreational areas at all seasons. The National Park Service has made a preliminary report on the project area and on the recreational aspects of the initial development. Its recommendations will be followed to the fullest extent possible.

## PLAN OF DEVELOPMENT

39. The initial development is keyed to transmountain diversion of water from the Colorado River drainage eastward to the upper Arkansas River Valley. The diverted water and reregulated native eastern slope water would provide for supplemental irrigation, furnish supplemental and new supplies of municipal water, and enable the generation of hydroelectric power. Other multiple-purpose aspects of the project include flood and sediment control, stream pollution abatement, and fish and wildlife conservation. All estimates, specifications, and description of features are necessarily preliminary and subject to some modification and refinement when detailed data becomes available.

40. As a result of the diversion of water from the Colorado River Basin, this potential initial development is consistent with the purposes of the Colorado River storage project. The extent of its relationship to the upper Colorado River Basin development and to the upper Arkansas River Basin development can be more firmly established as those developments proceed. In its plan for

the Colorado River storage project the Bureau of Reclamation contemplates at least six major regulatory reservoirs in the upper Colorado River Basin. The need for the storage project stems from the compacts pertaining to Colorado River waters. The Colorado River compact apportions the use of 7.5 million acre-feet of water annually to the upper Colorado River Basin. It also provides that the States of the upper division (Colorado, New Mexico, Utah, and Wyoming) will not cause the flow of the river at Lee Ferry, Ariz., to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years. This compact was signed November 24, 1922, and made effective pursuant to the terms of the Boulder Canyon Act. The upper Colorado River compact in turn apportions the use of Colorado River water to the four States and Arizona, and provides for the sharing of joint water obligations of the four States. The upper Colorado River compact was signed October 11, 1948, subsequently ratified by the upper basin States and approved by the Congress. Full consummation of the apportioned uses of Colorado River water in the upper basin States, consistent with the rights and obligations of the compacts and the Mexican Treaty of 1945, would require construction of major regulatory reservoirs in the upper basin.

41. *Western slope features.*—A system consisting of about 50 miles of canals and tunnels would enable the collection of water from Hunter Creek and the Fryingpan River—both tributaries of the Roaring Fork River. The water so collected would be diverted to the eastern slope through the potential Fryingpan-Arkansas Tunnel, about 6 miles in length. Since 1935, the Twin Lakes Reservoir & Canal Co. has diverted western slope water from the Roaring Fork drainage to its reservoir on the eastern slope. The company has a legal right to divert more water than it has diverted to date; but such increased diversions would be detrimental to fishery values in the Roaring Fork River and its tributaries above Aspen. In order to preserve those fishery values the project plan includes an extension of the collection system to the South Fork of Hunter Creek and enlargement of other project facilities to permit an exchange of water with the Twin Lakes Co. This plan hinges upon the execution of agreements whereby the company would refrain from certain diversions through its own system whenever the natural flow of the Roaring Fork River falls below a specified minimum in exchange for an equivalent supply delivered on the eastern slope through project facilities. The cost of these specific facilities and enlargements is estimated at $2,179,000 and is considered economically justifiable by the Fish and Wildlife Service on the basis of resulting benefits.

42. The Aspen Reservoir would be constructed near the town of Aspen to provide replacement water and also to provide water for future use in meeting demands in western Colorado. The reservoir, which would inundate about 650 acres and have an active capacity of 28,000 acre-feet, would be created by an earth-fill dam about 90 feet in height. A short supply canal would divert water from Hunter Creek to the reservoir.

43. The Aspen Dam site is at an altitude of 8,017 feet. The collection system for the transmountain diversion would be entirely above 10,000 feet altitude. The chief construction problems will be the short working season and transportation of materials.

44. The western slope features would enable the average annual diversion of an estimated 69,200 acre-feet of project water. As a result of eastern slope storage to be provided by the project, about 14,900 acre-feet of water could also be diverted annually by the Twin Lakes Co., which cannot now be diverted for lack of storage capacity. This would be in addition to its present average diversion of 38,000 acre-feet.

45. *Eastern slope supply and power features.*—In round figures, the major potential eastern slope project facilities include three earth-fill dams, 60 miles of power canal ranging in capacity from 300 to 1,000 second-feet, three diversion dams, over 10 miles of diversion canals, seven hydro-electric power plants and switchyards, three small forebays and two afterbays, nine substations, about 400 miles of transmission line, and a municipal water supply system. The latter system includes one diversion dam, 15 miles of reservoir supply canal for irrigation replacement water, three pumping plants, one small regulating reservoir, one treatment plant, and about 175 miles of pipelines. Other structures and equipment would be required for construction and operation such as one permanent camp, caretakers' residences and shops, warehouses, construction camps, offices and laboratories, and a communications system.

46. Imported and native water would be stored first in an enlarged Sugar Loaf Reservoir on the Lake Fork of the Arkansas River. Releases would flow about 20 miles south in the Elbert section of the Arkansas power canal, then through

the Elbert hydroelectric powerplant and into the enlarged Twin Lakes Reservoir. The 10-mile Snowden canal would divert additional Arkansas River water into the Twin Lakes Reservoir. From there, the water—increased by tributary interceptions and by the Wapaco diversion from the river—would flow south some 40 miles in the Arkansas power canal and be returned to the main stream near Salida. Power would be generated en route in the Granite, Wapaco, Princeton, Johnson, and Salida hydroelectric powerplants. Forebays would be provided above the Princeton, Johnson, and Salida plants. The existing Clear Creek Reservoir (capacity about 11,400 acre-feet) would be adapted for use as an afterbay for the Granite powerplant. An afterbay would be provided on the Arkansas River for the Salida plant. Near Salida and Canon City some water might be diverted for irrigation. The remainder would continue down the river to the potential Pueblo Reservoir. Most of the supplemental irrigation releases from that reservoir would be made through the Pueblo hydroelectric powerplant.

47. Summarized data on the three major eastern slope dams and reservoirs are as follows:

| Dam or reservoir | Present reservoir capacity (acre-feet) | Potential dimensions | | | |
|---|---|---|---|---|---|
| | | Total capacity (acre-feet) | Active capacity (acre-feet) | Normal surface area (acres) | Height of dam (feet) |
| Sugar loaf | 17,000 | 117,000 | 117,000 | 1,550 | 140 |
| Twin Lakes | 56,000 | 260,000 | 260,000 | 4,160 | 105 |
| Pueblo | | 400,000 | 390,000 | 6,700 | 180 |
| Total | 73,000 | 777,000 | 767,000 | 12,410 | |

48. The Colorado Fuel & Iron Corp., owner and operator of the Sugar Loaf Reservoir, has informally requested 10,000 acre-feet of project reservoir storage space in addition to replacement of its present capacity. The Twin Lakes Reservoir & Canal Co. has made a similar request for 54,000 acre-feet of additional reservoir storage space. Both companies would pay a service charge. Capacities of the potential Eastern Slope reservoirs have been tentatively allocated as follows:

| Function: | *Acre-feet* |
|---|---|
| Conservation | 315,600 |
| Power | 135,000 |
| Flood control (Pueblo Res.) | 93,000 |
| Sediment control (Pueblo Res.) | 94,400 |
| Dead storage (Pueblo Res.) | 2,000 |
| Colorado Fuel & Iron Corp | 27,000 |
| Twin Lakes Co | 110,000 |
| Total | 777,000 |

49. The seven power plants would have a total installed capacity of 104,800 kilowatts and an annual average output of 505 million kilowatt-hours of which 400 million kilowatt-hours would be firm energy. Losses would reduce the salable energy to approximately 467.2 million kilowatt-hours of which 370 million kilowatt-hours would be firm. Associated major power facilities include seven switchyards with a combined capacity of 116,440 kilovolt-amperes and a transmission system consisting of about 400 miles of 115-kilovolt lines with nine substations. The transmission system would serve customers of the United States and would interconnect with other utilities and enable the interchange and wheeling of power from various sources. The Colorado Fuel & Iron Corp. intermittently produces waste-heat electric engergy as a result of steel mill operations. If agreements could be reached, such energy might be fed into the project system on an exchange basis or under some other arrangement whereby more efficient project power operation would result. Additional generation in the Elbert powerplant might accrue from the exchange of Twin Lakes water involved in the maintenance of fish flows in the Roaring Fork River.

50. The Pueblo Reservoir would inundate some 500 acres of irrigated land. All other lands in the Eastern Slope reservoir sites and for the canals are either low-value private land or public land. The Eastern Slope reservoirs would require the relocations of about 20 miles of State highway and 20 miles of railroad, but no unusually difficult construction problems have become apparent. The

high altitude and short working season pose some problems for the Sugar Loaf and Twin Lakes enlargements and associated facilities. The dam and reservoir sites are situated over glacial moraines which may result in some seepage; however, tightness beyond stability is not necessary.

51. *Municipal water system.*—The project could provide supplemental municipal water for Colorado Springs and Pueblo. Complete replacement of existing municipal supplies has been requested by the valley towns of Manzanola, Rocky Ford, La Junta, Las Animas, Lamar, Crowley, Wiley, and Eads. Tentatively, 15,000 acre-feet of project water have been reserved annually for municipal use. Specific municipal supply facilities outlined hereinafter in paragraphs 52 and 56 are included in the project plan as a requested service. Such construction is proposed only if construction by the communities themselves proves to be infeasible. This phase of the project is flexible and susceptible of modification or elimination, in whole or in part, without rendering the remainder of the project economically infeasible.

52. A supplemental municipal supply for Colorado Springs would involve an exchange of irrigation water by means of project facilities. A pumping plant on upper Middle Beaver Creek would lift water to the city's system on Pike's Peak. En route to the city, the water would generate energy in two municipal powerplants, the output of which would exceed the loss in the Skaguay hydroelectric powerplant, on Middle Beaver Creek, owned by the Southern Colorado Power Co. Colorado Springs could reimburse the company for the lost power value. Replacement of the diverted water for irrigation use near Penrose would be accomplished by diverting water from Oil Creek to the existing Brush Hollow Reservoir. A diversion dam and a 15-mile supply canal would be necessary. Through a series of exchanges and coordinated operation of the Mount Pisgah Reservoir on Oil Creek and the Skaguay Reservoir, satisfactory replacement of irrigation water in the Arkansas Valley could be achieved

53. Four thousand acre-feet of project water annually have been allotted to Colorado Springs for its immediate requirements. Of this 4,000 acre-feet, 2,700 acre-feet could be pumped into the city's system from Beaver Creek. Replacement of this 2,700 acre-feet for irrigation would require 3,200 acre-feet of project water due to transit and other losses. The remaining 800 acre-feet of project water represents reserve for replacement of possible diversions to the city from other tributaries of the Arkansas River.

54. Pueblo requires 3,000 acre-feet of project water annually. Project facilities would also enable the conservation of 2,000 acre-feet of Wurtz ditch transmountain water for municipal use and treatment of Pueblo's present supply of 21,000 acre-feet. Delivery of water to Pueblo would be accomplished from the Pueblo Reservoir through a central system for all valley towns.

55. The valley towns require 8,000 acre-feet of project water annually, of which 460 acre-feet represents a reserve for those communities and others. The water would entirely replace existing unsatisfactory supplies.

56. Specific facilities for supplying Pueblo and the valley towns with municipal water include a pumping plant at the Pueblo Reservoir, a water-treatment plant, a dual pipeline to Pueblo and a small regulating reservoir, a trunk pipeline about 130 miles in length to Lamar, and about 36 miles of branch pipelines to Crowley, Wiley, and Eads.

57. The municipal water supply system would involve no unusual construction problems or difficulties in securing rights-of-way.

58. *Construction schedule.*—About 10 years would be required to construct the initial development. Early concurrent construction of the Aspen, Twin Lakes, and Pueblo Reservoirs, the Fryingpan-Arkansas tunnel, and several eastern slope canals is planned to facilitate filling the reservoirs. The western slope collection system would be expanded gradually from the transmountain tunnel. All hydroplants except Pueblo have been scheduled for simultaneous completion so their operation can be integrated as a unit.

59. *Water supply.*—The first phase of the Gunnison-Arkansas project (Roaring Fork diversion) contemplates the average annual consumptive use of water from the Colorado River Basin as follows (measured at points of diversion):

| Explanation: | *Acre-feet* |
|---|---|
| Diversion from project collection system of project water | 69, 200 |
| Diversion for fish preservation purposes | 3, 000 |
| Losses from Aspen Reservoir and consumptive losses in collection conduit | 3, 000 |
| Total | 75, 200 |

60. The water to be imported from the Colorado River watershed is to come out of Colorado's apportionment under the upper Colorado River Basin compact of October 11, 1948. Under that compact, the State of Colorado is apportioned the consumptive use of 51.75 percent of the water available for use in the upper Colorado River Basin, after deducting a use of not to exceed 50,000 acre-feet annually in Arizona. Colorado's apportionment of Colorado River Basin water is estimated to be about 3,855,000 acre-feet annually. It is estimated that about 1,590,000 acre-feet will be required for use by existing and authorized projects, leaving 2,265,000 acre-feet annually for use by future projects. Of this amount it is estimated that 440,000 acre-feet should be reserved to meet Colorado's share of depletions caused by main stem reservoirs required for long-time holdover storage to make the water available for use under the Colorado River compact. About 1,825,000 acre-feet annually would remain for use by potential projects. These figures indicate the availability of about 1,750,000 acre-feet of water annually, after full development of the proposed initial development, Gunnison-Arkansas project, to meet other potential uses of Colorado River water in Colorado.

61. The 1947 report on the Colorado River (H. Doc. 419, 80th Cong., 1st sess.) shows estimated uses by potential irrigation projects, within the natural Colorado River Basin in Colorado, of 870,000 acre-feet annually. Studies are underway to refine the estimate of potential within-basin uses in Colorado for all purposes including industrial uses. Review of available information shows that the total of all such potential uses will likely be less than the figure of 1,750,000 acre-feet.

62. Present and prospective uses from Fryingpan River would be supplied by the bypass of water from the collection canals. Storage releases from the Aspen Reservoir would replace water diverted that would otherwise be needed by present and prospective users along the Roaring Fork and Colorado Rivers.

63. During the 1911–44 period of study the natural water supply of the project area between Pueblo and the Colorado-Kansas boundary averaged 1,143,000 acre-feet annually, including return flows but excluding about 48,000 acre-feet from eight transmountain diversions. Disposition of the average annual supply was as follows:

| Disposition: | *Acre-feet* |
|---|---|
| Summer irrigation | 656,000 |
| Winter irrigation | 160,000 |
| Reservoir evaporation | 50,000 |
| Outflow to Kansas | 277,000 |
| Total | 1,143,000 |

64. The estimated ideal headgate diversion requirements during the irrigation season average 983,000 acre-feet. Reconstructed data showing the effect of Twin Lakes diversion and the John Martin Reservoir—had they been in operation for that entire period—disclose that the historical headgate diversions would have averaged 720,000 acre-feet seasonally, of which 643,000 acre-feet would be within the ideal irrigation schedule. The difference of 340,000 acre-feet represents the average annual headgate shortage. Through optimum utilization of all available supplies, new transmountain diversions, and reuse of return flows, the project could effectuate an estimated supply of 184,600 acre-feet of supplemental irrigation water at the canal headgates in the main valley. That supply would reduce the average annual headgate shortage to about 155,000 acre-feet—a reduction from 35 percent shortage of ideal requirements to about 16 percent shortage.

65. The total irrigation water supply to be made available by the project would consist of imported water, conserved flood flows, private supplies reregulated in project reservoirs, and usable return flows. Reregulated private supplies include some winter flows of the Arkansas River that are presently diverted for direct-flow use but which, by agreement, could be converted to more beneficial summer use through storage in the Pueblo Reservoir. Return flows of the project municipal water are estimated at 70 percent. The total irrigation headgate supply is estimated at 50 percent more than the initial supply, based upon successive reuses of the water at the rate of 40 percent return flow from each application. The next table shows the source of water to be made available for the Arkansas Valley, reconstructed as annual averages for the 1911–44 period of study.

49438—54——2

[Thousands of acre-feet]

| Source | Gross | Losses | Net | Headgate supply |
|---|---|---|---|---|
| Fryingpan diversion | 69.2 | 15.5 | 53.7 | |
| Arkansas River floods | 50.0 | 32.0 | 18.0 | |
| Total project water | 119.2 | 47.5 | 71.7 | |
| Less municipal water | 15.0 | | 15.0 | |
| Project irrigation supply | 104.2 | 47.5 | 56.7 | 85.1 |
| Municipal return flow, Arkansas Valley | 7.0 | 2.5 | 4.5 | 5.7 |
| Additional Twin Lakes diversion | 14.9 | 2.4 | 12.5 | 18.8 |
| Converted winter flow | 93.0 | 19.0 | 74.0 | 74.0 |
| Total valley irrigation supply | 219.1 | 71.4 | 147.7 | 184.6 |
| Tributary municipal return flow | | | 3.5 | 5.2 |
| Total usable irrigation supply | | | 151.2 | 189.8 |

## FINANCES AND PROJECT OPERATION

66. Based upon preliminary designs, and upon prices prevailing in October 1949, the estimated construction cost of the project is $147,440,000. About 25 percent of that cost would be for western slope structures and the transmountain tunnel. The annual operation, maintenance, and replacement expense is estimated to be $1,335,200.

| Feature | Construction cost | Annual operation, maintenance, and replacement |
|---|---|---|
| Dams and reservoirs | $64,334,000 | $30,760 |
| Diversion canals and conduits | 30,499,000 | 65,870 |
| Power features | 34,021,000 | 846,990 |
| Municipal supply systems | 18,050,000 | 391,580 |
| Operation and maintenance during construction | 536,000 | 0 |
| Total | 147,440,000 | 1,335,200 |

67. *Cost allocation.*—Construction costs have been allocated to the various project functions through use of the alternative justifiable expenditure method. That method utilizes the estimated cost of the most economical substitute single-purpose facility which would provide benefits equivalent to those accruing in a multiple-purpose development. The tentative allocation of construction costs and distribution of annual operation, maintenance, and replacement expenses are as follows:

| Function | Construction cost | Annual operation, maintenance, and replacement |
|---|---|---|
| Irrigation | $59,930,000 | $76,080 |
| Power | 40,032,000 | 854,050 |
| Municipal water | 29,522,000 | 405,070 |
| Total returnable | 129,484,000 | 1,335,000 |
| Flood control | 15,777,000 | [1] |
| Fish and wildlife | 2,179,000 | [1] |
| Total nonreturnable | 17,956,000 | |
| Total costs | 147,440,000 | 1,335,200 |

[1] Included above.

68. *Project operation and return on investment.*—The plan of operation calls for the formation of a water conservancy district, under the Colorado Water Conservancy District Act of 1937, as amended, which would contract with the Government for payment of project services performed in the collection, storage, regula-

tion, and release of water. Supplemental irrigation water at specified rates would be released to the district at reservoir outlets or possibly along the river, depending upon circumstances. The proposed basic rate of $3.60 per acre-foot at the Pueblo Reservoir has been determined to be within the payment capacity of the water users. The district would assume responsibility for delivery of irrigation water. The district, or possibly another entity, would contract with the Government for Federal construction of the specific municipal water system, for district operation and maintenance of that system, and for delivery of water from the joint water-supply system. The district would also have other sources of annual revenue: levies from an ad valorem tax on taxable property benefited by the project, a service charge for the storage of the additional Twin Lakes irrigation water, and a service charge for project storage of the additional Colorado Fuel & Iron industrial water which is included with municipal supplies for pay-out analysis. Estimated annual project revenues, exclusive of revenues expected from the regulation of winter water, are shown in the following table:

| Function and source of revenue: | *Annual value* |
|---|---|
| Irrigation and district: | |
| Project water (56,700 acre-feet at $3.60) | $204, 120 |
| Twin Lakes service (12,500 acre-feet at $2) | 25, 000 |
| District tax ($132 million at 1 mill minus 10 percent) | 119, 000 |
| Subtotal | 348, 120 |
| Less operation, maintenance, and replacement | 76, 080 |
| Net irrigation revenues | 272, 040 |
| Power: | |
| 370,000,000 kilowatt-hours at 5.5 mills; 97,125,000 kilowatt-hours at 3.5 mills | 2, 374, 938 |
| Less operation, maintenance, and replacement | 854, 050 |
| Net power revenues | 1, 520, 888 |
| Municipal and industrial water: | |
| Municipal supplies (38,000 acre-feet at various rates) | 1, 476, 410 |
| Colorado Fuel & Iron (4,000 acre-feet at $2) | 8, 000 |
| Subtotal | 1, 484, 410 |
| Less operation, maintenance, and replacement | 405, 070 |
| Net municipal water revenues | 1, 079, 340 |
| Total annual net project revenue | 2, 872, 268 |

69. Parts of the interest on return payments from power (3 percent) and municipal water (2 percent) would be applied to the irrigation investment. The sources of revenue for retirement of returnable costs are shown below.

| Source | Project revenue | Cost allocation |
|---|---|---|
| Irrigation: | | |
| Net revenue, irrigators and district, 40 years | $10, 881, 600 | |
| From power revenue, 38 years | 35, 478, 000 | |
| From municipal water revenue, 38 years | 13, 570, 400 | |
| Retired allocation | | $59, 930, 000 |
| Power: | | |
| Net revenue, 53 years | 80, 324, 113 | |
| Less interest to irrigation, 38 years | −35, 478, 000 | |
| Less unapplied interest | −4, 570, 849 | |
| Less earned surplus, 53d year | −243, 264 | |
| Retired allocation | | 40, 032, 000 |
| Municipal water: | | |
| Net revenue, 40 years | 43, 173, 600 | |
| Less interest to irrigation, 38 years | −13, 570, 400 | |
| Less unapplied interest | −72, 669 | |
| Less earned surplus, 40th year | −8, 531 | |
| Retired allocation | | 29, 522, 000 |
| Total allocation returned by revenues | | 129, 484, 000 |

70. If the value for the regulation of winter water is estimated at $1.25 per acre-foot, which is comparable to current costs for like services, an additional return of $3,700,000 or more can be expected from irrigation over the repayment period. The actual value remains to be determined. The value of this service must be an amount substantially less than $3.60 per acre-foot which is the value at the Pueblo Reservoir established for a new supplemental water supply.

71. *Benefits.*—The economic justification of any project can be tested by a benefit-cost ratio which measures the benefits obtainable contrasted with the attendant Federal costs of bringing about those benefits. The net Federal project investment consists of the total construction cost plus interest at the rate of 2½ percent during construction less the present worth of the hundredth-year terminal salvage value of principal project works. That investment is translated into an annual equivalent by amortization over 100 years at 2½ percent. The annual project investment cost is obtained by adding to the annual equivalent the adjusted annual operation, maintenance, and replacement expense.

| | |
|---|---|
| Annual benefits: | |
| Irrigation | $3,339,000 |
| Power | 4,064,000 |
| Municipal water | 1,662,000 |
| Flood control | 583,000 |
| Sediment control | 141,000 |
| Total annual benefits | 9,789,000 |
| Annual costs: | |
| Project investment | 4,165,000 |
| Adjusted operation, maintenance, and replacement | 1,403,000 |
| Total annual costs | 5,568,000 |
| Benefit-cost ratio | 1.76:1.00 |

72. The preceding calculation includes direct and indirect benefits for the initial development. It is significant that the sum of direct irrigation benefits to farmers of $1,065,000, direct power benefits of $2,375,000, and benefits to municipal water, flood control, and sediment control is sufficient to support the annual project costs.

73. The report on the Colorado River storage project and participating projects presents a plan for a system of regulatory reservoirs that would permit maximum development of the upper Colorado River Basin water resources for beneficial consumptive uses and assure the required deliveries of water at Lee Ferry to meet the requirements of the Colorado River compact. If it is assumed that the Colorado River storage project will be constructed, and if it is considered proper in analyzing the Gunnison-Arkansas project to assign an appropriate share of the cost of the Colorado River storage project, then the assignable annual cost to the Gunnison-Arkansas project is estimated at $2.35 per acre-foot of consumptive use of water. The net effect, so far as the Gunnison-Arkansas project is concerned, would be to alter slightly the economic justification. The annual cost would increase from $5,568,000 to $5,731,000, and the benefit-cost ratio would be reduced slightly from 1.76:1.00 to 1.71:1.00.

74. *Operating principles.*—On November 24, 1948, a policy and review committee was organized by the Colorado Water Conservation Board to study and review plans and reports on the first stage of the Gunnison-Arkansas project. The committee was composed of representatives of the board, the Colorado Game and Fish Commission, western Colorado, the Arkansas Valley, and the city of Colorado Springs. The committee recommended the following principles of project operation on January 19, 1951:

"The construction and operation of the project involve the diversion of water from the headwaters of the Fryingpan River and other tributaries of the Roaring Fork River to the Arkansas River Basin. The project contemplates—

"(*a*) The maximum conservation and use of the diverted waters;

"(*b*) The protection of western Colorado water uses, both existing and potential, in accordance with the declared policy of the State of Colorado; and

"(*c*) The preservation of recreational values.

"In order to accomplish such purposes the project shall be operated by the United States in compliance with the Federal reclamation laws, the laws of the State of Colorado relating to the appropriation, use, or distribution of water, and the following operating principles:

"1. As used herein—

"(*a*) 'Project' means that certain enterprise planned and designed by the Bureau of Reclamation, Department of the Interior, for the transmountain diversion of water from the headwaters of the Fryingpan River and other tributaries of the Roaring Fork River to the basin of the Arkansas River, together with all of its appurtenant works and facilities in both eastern and western Colorado.

"(*b*) 'Eastern Colorado' means that portion of the State of Colorado lying within the natural drainage basin of the Arkansas River.

"(*c*) 'Western Colorado' means that portion of the State of Colorado lying within the natural drainage basin of the Colorado River and served by diversions made from the Colorado River, or its tributaries, above its confluence with the Gunnison River.

"(*d*) 'Eastern Colorado Conservancy District' means that entity to be hereafter created to contract for payment to the United States of an appropriate portion of project costs allocated to certain water uses in eastern Colorado.

"(*e*) 'Aspen Reservoir' means not only the reservoir presently planned for construction near the town of Aspen as part of the project but also, unless the context requires otherwise, any other reservoir that may be constructed in western Colorado above the town of Aspen in lieu of that reservoir for the purpose of protecting water uses in western Colorado.

"(*f*) 'C. f. s.' means cubic feet of water per second of time.

"2. The Aspen Reservoir shall be constructed and maintained on the Roaring Fork River above the town of Aspen, Colo., with an active capacity of about 28,000 acre-feet and with a reasonable expectancy that it will fill annually. The 28,000 acre-feet of water stored therein shall be available for replacement purposes in western Colorado. All of such stored water shall be released under the conditions and limitations hereinafter set forth.

"3. The cost of construction and perpetual operation and maintenance of the Aspen Reservoir shall be a charge against the project and shall be paid from project revenues or as otherwise provided by the Congress of the United States.

"4. The Aspen Reservoir shall be completed before any water is diverted to eastern Colorado by means of the project.

"5. The primary purpose of Aspen Reservoir is to furnish, in like manner as if the project were constructed by a water conservancy district organized pursuant to the laws of the State of Colorado, the water required for the protection of western Colorado water users by the provisions of section 1, chapter 192, Colorado Session Laws, 1943, reading as follows: '*Provided, however*, That any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado River and its tributaries in Colorado, by any district created under this chapter, shall be subject to the provisions of the Colorado River compact and the Boulder Canyon Project Act, as amended; that any such works or facilities shall be designed, constructed, and operated in such a manner that the present appropriations of water, and in addition thereto prospective uses of water for irrigation and other beneficial consumptive-use purposes, including consumptive uses for domestic, mining, and industrial purposes, within the natural basin of the Colorado River in the State of Colorado, from which water is exported, will not be impaired nor increased in cost at the expense of the water users within the said natural basin; and that the facilities and other means for the accomplishment of said purpose shall be incorporated in, and made a part of, any project plans for the exportation of water from said natural basin in Colorado.'

"6. The replacement capacity of the Aspen Reservoir is that portion of the total reservoir capacity required to protect existing rights to the use of water in western Colorado for domestic, irrigation, and manufacturing purposes (including power generation) and hereafter acquired rights to the use of water in western Colorado for domestic irrigation, and manufacturing purposes (excluding power generation) against any and all losses of needed water because of stream depletions resulting from project operations. In the determination of such replacement capacity, consideration shall be given to, but not necessarily limited to, needs for water for the following purposes, such needs, however, not to be for quantities in excess of those quantities of water which would have been available from the Roaring Fork River to supply such needs if the project had not been constructed:

"(*a*) To supply existing rights below Aspen Reservoir;

"(*b*) To irrigate new land and provide for supplemental irrigation in western Colorado;

"(*c*) To satisfy the obligation of the Roaring Fork River to contribute its proportional share of the required winter flows at a point immediately below the confluence of the Roaring Fork River and the Colorado River; and

"(*d*) To satisfy the obligation of the Roaring Fork River to contribute its proportional share of a demand of at least 300,000 acre-feet of water annually in the Colorado River below its confluence with the Roaring Fork River, for domestic and manufacturing uses. Said demand for use in western Colorado is to be met at the times and in the amounts required.

"Water stored in the replacement capacity of the Aspen Reservoir shall be released by the United States, upon the request of the State administrative agency having responsible charge of the distribution of the water of the stream or streams affected, whenever the needs in the Colorado River Basin in western Colorado below the project diversion points for the uses covered by this paragraph 6 exceed the available supply of water; provided that the rate of release of such stored water shall be reasonable and proper with due regard for the needs in western Colorado for replacement water and with due regard, also, for the obligation of the project to supply such water.

"No charge shall ever be imposed for water released from, or made available by reason of releases from, the replacement capacity of the Aspen Reservoir.

"7. That portion of the total capacity of the Aspen Reservoir not needed as replacement capacity constitutes surplus capacity. Water stored in such surplus capacity may be sold or leased by the United States to water users in western Colorado. Charges for the use of such water shall be comparable to charges for use of project water for similar purposes in eastern Colorado with appropriate adjustment for the repayment ability of such water users. If it hereafter appears that the cost of procuring water, from sources other than the surplus capacity of the Aspen Reservoir, for the same uses as those to which water from the surplus capacity of the reservoir is to be made available shall have been increased by reason of the construction and operation of the project, then the charges for water released from the surplus capacity shall be diminished by the amount of such increase in cost.

"8. Project diversions from Lime Creek shall be made only in the months of May and June of each year.

"9. To protect recreational values, including fishing, no diversions from western Colorado will be made which reduce the remaining aggregate stream flows to less than either of the following minimum standards:

"(*a*) The Fryingpan collection system at the points of diversion collectively, exclusive of Lime Creek—15 c. f. s. October 1 through March 31; 30 c. f. s. April 1 through September 30;

"(*b*) Near Norrie (immediately below the junction of North Fork and Fryingpan River)—30 c. f. s. October 1 through March 31; 100 c. f. s. April 1 through April 30, 150 c. f. s. May 1 through May 31; 200 c. f. s. June 1 through June 30; 100 c. f. s. July 1 through July 31; 75 c. f. s. August 1 through August 31; 65 c. f. s. September 1 through September 30.

In maintaining the above minimum standards, the project diversions shall be regulated, so far as is practicable, in such a manner that the North Fork, the Fryingpan River, and each of the tributaries of those streams shall contribute to the residual stream flows required by those minimum standards quantities of water in proportion to their natural contributions.

"10. An appropriate written contract shall be made whereby the Twin Lakes Reservoir & Canal Co. shall refrain from diverting water whenever the natural flow of the Roaring Fork River and its tributaries shall be only sufficient to maintain a flow equal to or less than that required to maintain the recommended average flows in the Roaring Fork River at the head of the proposed Aspen Reservoir in a quantity proportionate to the respective natural contributions of those streams from which diversions are made to the natural flow of the Roaring Fork River. The recommended average flows above mentioned are flows in quantities equal to those recommended as a minimum at the head of the Aspen Reservoir according to the following schedule submitted by the United States Fish and Wildlife Service and the Colorado Game and Fish Commission:

| Month | Average second-feet | Acre-feet (in thousands) | Month | Average second-feet | Acre-feet (in thousands) |
|---|---|---|---|---|---|
| October | 44 | 2.7 | May | 100 | 6.2 |
| November | 35 | 2.1 | June | 120 | 7.1 |
| December | 29 | 1.8 | July | 100 | 6.2 |
| January | 26 | 1.6 | August | 63 | 3.9 |
| February | 25 | 1.4 | September | 44 | 2.6 |
| March | 24 | 1.5 | | | |
| April | 64 | 3.8 | Total | | 40.9 |

"In maintaining the above averages, at no time shall the flow be reduced below 15 c. f. s. during the months of August to April, inclusive, or below 60 c. f. s. during the months of May to July, inclusive, providing the natural flow during said period is not less than these amounts. The obligation to supply the minimum stream flow as set forth in the above table on the Roaring Fork River shall, to the extent of 3,000 acre-feet annually, be a project obligation to be supplied from any waters diverted from the south tributaries of Hunter Creek, Lime Creek, Last Chance Creek, or any of them.

"The Twin Lakes Reservoir & Canal Co. shall not be required to refrain from diverting water under its existing decrees from the Roaring Fork River except to the extent that a like quantity of replacement water is furnished to said company without charge therefor through and by means of project diversions.

"If by reason of storage capacity in the Aspen Reservoir, the Twin Lakes Reservoir & Canal Co. derives additional water or other benefits or advantages it would not have realized had this project not been constructed, then nothing herein contained shall prevent the project from making appropriate charges for such water or other benefits or advantages.

"11. All lands acquired for project construction and operation and water surfaces of project reservoirs will be open to the public for recreational purposes, excepting those areas reserved by the operating agency.

"12. The project will be operated in such a manner that those in eastern Colorado using project water imported from the Colorado River Basin for domestic purposes shall have preference over those claiming or using water for any other purpose.

"13. The project is to be operated in such a manner as to secure the greatest benefit from the use and reuse of imported project waters within project boundaries in the State of Colorado.

"14. Any and all benefits and rights of western Colorado water users in and to water stored in Green Mountain Reservoir, as described and defined in Senate Document 80, Seventy-fifth Congress, first session, shall not be impaired or diminished by this project.

"15. The project, its operation, maintenance, and use shall be subject to the provisions of the upper Colorado River Basin compact of October 11, 1948 (Public Law 37, 81st Cong., 1st sess.), the Colorado River compact of November 24, 1922 (H. Doc. 605, 67th Cong., 4th sess.), and the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057–1064). In the event any curtailment of use of Colorado River water in the State of Colorado is necessary to satisfy the provisions of the Colorado River compact or the upper Colorado River Basin compact, then the diversions by the project for use in eastern Colorado shall be curtailed before there is any curtailment of the right to store water in Aspen Reservoir in a quantity not in excess of the capacity of that reservoir for use in western Colorado in accordance with these operating principles.

"16. The Secretary of the Interior shall at any time have the option to obtain or require the transfer to the United States of any and all rights initiated or acquired by the appropriation or use of water through the works of the project in eastern Colorado, except vested rights to present appropriations; provided, however, that the title so taken shall be subject to a beneficial use of such water as may be provided in the payment contract or contracts. The rights to store water in Aspen Reservoir under the applicable laws of the State of Colorado shall be initiated and acquired by and held in the name of the United States pursuant to those laws.

"17. To assure project operation in conformity with the operating principles heretofore stated, to provide a means for the collection and interchange of information, and to provide a method for the continued study of project operations to the end that, if the stated operating principles may be improved upon, recommendations for changes may be made to the contracting parties, a commission shall be created in an appropriate manner to be composed of one representative of the Eastern Colorado Conservancy District, one representative of the Colorado River Water Conservation District, two representatives of the United States, and one representative of the State of Colorado appointed by the Colorado Water Conservation Board after consultation with the Colorado Game and Fish Commission. The powers of such commission shall be limited to the collestion of data, the makings of findings of fact, and the suggestion of changes in operating principles."

CONCLUSIONS

75. The waters of the Arkansas River in the Colorado portion of the upper Arkansas River Basin are overappropriated. Serious distress is caused to the

economy of the basin in short water years through loss in crop production. Supplemental irrigation water supplies are needed. The additional crop production would find a ready market in the urban centers of Colorado and the Nation.

76. No new sources of water within the means of the municipalities and industries are apparent. Present municipal supplies, even after substantial acquisition of irrigation rights, are barely adequate to supply existing requirements. Additional quantity and better quality of water are critically needed.

77. Normal uses of electric energy would expand rapidly in the power market area if not restricted by a limited supply. Resource development would be encouraged if energy were available in plentiful supply.

78. Floods in the upper Arkansas Valley threaten the loss of property and discourage investment. Sediment deposition chokes channels, increases flood threats, and raises maintenance costs of extensive irrigation systems. Stream pollution threatens health and destroys fish habitat. Flood, sediment, and pollution control would lower costs and remove threats.

79. Recreational, fish, and wildlife resources are valuable assets of Colorado and of the Nation. These resources should be protected and enhanced to the greatest extent practicable.

80. Misuse of forests and ranges reduces production and contributes to the sedimentation of streams. Tailings from mines add to the silt burden and pollution of otherwise usable water supplies. Better management practices and silt prevention methods should be encouraged.

81. The initial development of the Gunnison-Arkansas project would supply the most pressing and immediate needs of the Upper Arkansas River Basin.

82. The diversion area has a plentiful supply of water, part of which could feasibly be diverted without detriment to that area or to downstream users. Although all possible future water requirements for the entire western slope have not been fully determined, it is concluded that there is an adequate water supply from Colorado's allocated share of the Colorado River Basin water for the proposed initial development of the Gunnison-Arkansas project, Roaring Fork diversion, over and above present and prospective consumptive uses within the natural basin of the Colorado River in Colorado. Western slope interests would be protected by the Aspen Reservoir, by special provisions for preservation of fish and wildlife, by equitable operation of the project, and by assurance of noninterference in the use of the replacement facilities provided by the Colorado-Big Thompson project.

83. The initial development is engineeringly feasible and economically justified. It represents the minimum practical project. It is designed as a self-contained unit and its construction would not imply a commitment for expansion, extension, or enlargement. Neither would it impair nor duplicate future development.

84. The estimated cost of the initial development of the Gunnison-Arkansas project based on October 1949 prices is $147,440,000.

85. The tentative allocation of this total cost among the various functions to be served is as follows:

| Function: | *Allocated cost* |
|---|---|
| Irrigation: | |
| Probably can be returned in 40 years without interest through payments by the irrigation water users and district beneficiaries | $10, 881, 600 |
| Probably can be returned without interest through application of interest on power and municipal water investment | 49, 048, 400 |
| Power: Probably can be returned in 50 years with interest at 3 percent | 40, 032, 000 |
| Municipal and industrial water supply: Probably can be returned in 40 years with interest at 2 percent | 29, 522, 000 |
| Flood control | 15, 777, 000 |
| Mitigation of losses to fish and wildlife resources: In accordance with Public Law 732, 79th Cong., 2d sess. (60 Stat. 1080) | 2, 179, 000 |
| Total | 147, 440, 000 |

86. The project would provide other benefits for which allocations are not authorized under existing law. Subsequent allocation of project construction costs to such beneficial functions should be made in the event of future legislation.

87. Continued studies and investigations in the project area and in contiguous areas within the drainage of both slopes should be pursued vigorously on a depart-

mental basis, in cooperation with other Federal, State, and local agencies, toward the objective of wise conservation and beneficial use of all natural resources.

RECOMMENDATIONS

88. It is my recommendation that—

A. The Secretary of the Interior approve this report and substantiating documents.

B. This report together with the substantiating documents be transmitted for review to all Federal agencies having an interest in the project, to the States signatory to the Colorado River compact and to the States of Kansas and Oklahoma.

C. This report and substantiating documents, together with such amendments as may be appropriate pursuant to review comments by the Federal agencies and States, be submitted to the President and the Congress with the recommendation that the plan for the initial development of the Gunnison-Arkansas project including transmission facilities be approved and authorized.

D. The Congress authorize the appropriation of funds for construction, operation, and maintenance of the proposed works, under the direction of the Secretary of the Interior, in accordance with the Federal reclamation laws (act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof or supplementary thereto) except to the extent otherwise specifically set forth in this report, with such modifications, omissions, or additions to the works as the Secretary may find proper from time to time for accomplishing the objectives of the project.

E. The project be operated under the direction of the Secretary of the Interior in accordance with the operating principles set forth in this report or as the principles may be modified in the future by agreement between the Secretary and the commission established by the State of Colorado.

F. All or any part of the specific municipal water-supply systems described in this report be constructed by the Secretary of the Interior, only after satisfactory evidence is presented to the Secretary of the Interior that it would be infeasible for the communities involved to construct or to finance the construction of such work themselves, singly or jointly.

G. In the event it is determined that said specific municipal water systems are to be constructed by the Secretary of the Interior, a contract, providing among other things for payment to the United States of the actual cost of construction over a period of 40 years from the year in which the municipal water is first delivered with interest at the rate of 2 percent per annum and providing that operation, maintenance, and replacement of the works be assumed by the contracting party or parties, be a condition precedent to the start of construction of such works.

H. The Secretary of the Interior be authorized to establish rates for collection, transportation, regulation, and delivery of water at a designated point or points in the supply system to the municipalities and industries at the lowest price consistent with sound business principles, including interest at the rate of 2 percent per annum, but in no case higher than the cost of an alternative single-purpose supply of equal quantity and quality. The contracts providing for such deliveries should be long term or short term but not to exceed 40 years. Each such contract should include appropriate provision for one or more renewals, the terms and conditions of the renewed contract or contracts to be determined in the light of the situation at the time of renewal.

I. The Secretary of the Interior be authorized, upon agreement with the water users, to make either short-term or long-term contracts for collection, transportation, regulation, and delivery of water for irrigation purposes at a designated point or points in the supply system. Such contracts should be for such period, not to exceed 40 years, and at rates, either fixed or variable, by the application of such formula as the parties shall have agreed upon to reflect improvement in, or deterioration of, the payment ability of the water users, and which will, in the Secretary's judgment, produce revenues at least sufficient to cover an appropriate share of the annual operation and maintenance cost and an appropriate share of such fixed charges as the Secretary deems proper. Due regard being given to income from the contracting organization's other sources, the rates provided in such contract should be such that the water users shall return within the shortest period, consistent with their ability, that part of the cost of construction of works connected with water supply and allocated to irrigation and assigned to be returned by the contracting organization. Such contracts should require payment of said rates each year in advance of delivery of water for said year. Such con-

tracts should include provisions for the right of renewal thereof, once or more than once, under stated terms and conditions mutually agreeable to the parties and subject to increase or decrease in rates corresponding to increase or decrease of costs of construction and of operation and maintenance or improvement or deterioration in the payment ability of the water users. Such right of renewal should be exercised within such reasonable time prior to the expiration of the contract as the parties shall have agreed upon. All amounts paid to the United States in excess of operation and maintenance during the period of water deliveries thereunder should be credited to the payment of that appropriate share of the cost of construction of works connected with water supply and allocated to irrigation and, when the total of such credits equals the amount allocated to irrigation and assigned to be paid by the contracting organization, the charges should be reduced to cover only operation, maintenance, and replacement costs.

J. Contracts for the collection, transportation, regulation, and delivery of water supplies at designated points in the supply system be subject to section 8 of the Reclamation Act of June 17, 1902 (32 Stat. 388), provided that this provision be construed neither as vesting rights to the delivery of water in quantities greater than those specified in any such contract or vesting rights to continue to receive water in the event of default in payment thereunder, nor as preventing the delivery elsewhere of the water covered thereby in the event of default in payment continuing over a period of five consecutive years or the failure to renew such contract.

K. The Secretary of the Interior establish rates for the sale of power at the lowest price consistent with sound business principles but in no case higher than the cost of power from alternate sources in order to encourage the most widespread use of power throughout the area of service.

L. Suitable language be included in the authorizing document whereby assurance is given that any and all benefits and rights of western Colorado water users in and to water stored in Green Mountain Reservoir, as described and defined in Senate Document 80, Seventy-fifth Congress, first session, shall not be impaired or diminished by this project.

M. The Congress authorize the appropriation of such sums as may be necessary for the continued investigation of the comprehensive plan by the agencies of the Department of the Interior in cooperation with other Federal, State, and local agencies for the development of the natural resources of the upper Arkansas River Basin including importation of additional supplies of water into the basin which may be determined to be in excess of the present and potential requirements of the basin from which exportation may be proposed.

N. Suitable language be included in the authorizing document clearly stating that authorization or appropriation of funds for the project or for the continued investigations stated above shall not in any way constitute a commitment, real or implied, to further importations.

AVERY A. BATSON.

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DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
*Washington 25, D. C., April 16, 1951.*

The SECRETARY OF THE INTERIOR.

SIR: This is my proposed report on the initial development, Roaring Fork diversion, of the potential Gunnison-Arkansas project, Colorado. My report is based on and incorporates the accompanying report of the regional director, Bureau of Reclamation, Denver, Colo., dated February 23, 1951.

The potential Gunnison-Arkansas project is a major unit in the comprehensive plan of development of the water resources of the upper Arkansas River Basin. The initial development (Roaring Fork diversion) is a multiple-purpose project involving transmountain diversion of water from the Roaring Fork River, a tributary of the Colorado. This development is designed as a self-contained unit, and its construction would not imply a commitment for developing future water supplies in the Gunnison River Basin for diversion to the Arkansas River Basin. This development would provide (*a*) about 185,000 acre-feet of supplemental irrigation water at canal headgates in the Arkansas Valley through transmountain diversion, conservation of flood flows, reregulation of winter flow, and reuse of return flows for water-thirsty lands which, even with this additional supply, will

experience an average annual headgate shortage of about 16 percent; (*b*) about 15,000 acre-feet of municipal water to supplement the municipal supply for Colorado Springs, Pueblo, and several Arkansas Valley towns where additional quantity and better quality water is critically needed; (*c*) about 467,000,000 kilowatthours of electric energy to help meet the critical need for electric power in the project service area and permit expansion of the normal uses of electric energy; (*d*) flood protection which would eliminate 66 percent of the probable annual flood damages between Pueblo and the John Martin Reservoir, estimated to be about $890,000; (*e*) sediment control, stream-pollution abatement, and preservation and propagation of fish and wildlife in certain areas; all of which are important and valuable contributions of the project.

These purposes would be accomplished through construction of (*a*) a system of about 50 miles of canals and tunnels on the western slope of the Continental Divide for the collection of water from Hunter Creek and Fryingpan River, tributaries of the Roaring Fork River; (*b*) Aspen Reservoir, with an active capacity of 28,000 acre-feet near the town of Aspen on the western slope to provide replacement water and water for future use in meeting the demands in western Colorado; (*c*) the Fryingpan-Arkansas tunnel, about 6 miles in length, for diverting water collected on the western slope to the eastern slope; (*d*) the Sugar Loaf Reservoir on the eastern slope of the upper Arkansas Basin, enlarged from its present capacity of 17,000 acre-feet to 117,000 acre-feet for storage and regulation of water imported from the western slope; (*e*) the Snowden diversion dam on the Arkansas River above Snowden, Colo., and the Snowden diversion canal which would convey water from the Arkansas River to the enlarged Twin Lakes Reservoir; (*f*) the Twin Lakes Reservoir in the upper Arkansas Basin, a few miles south of Snowden, Colo., enlarged from its present active capacity of 56,000 acre-feet to 260,000 acre-feet, for storage and regulation of water imported from the western slope by the Fryingpan-Arkansas diversion, water imported by existing Twin Lakes diversion, and water diverted from the Arkansas River by the Snowden canal; (*g*) the Pueblo Reservoir on the Arkansas River west of Pueblo, Colo., with a capacity of 400,000 acre-feet to store water for irrigation and municipal use and for flood control; (*h*) a project power system comprising 60 miles of canals, seven power plants have an installed capacity of 104,800 kilowatts, seven switchyards, nine substations, and about 400 miles of transmission lines; (*i*) specific municipal water supply facilities for furnishing additional municipal water to Colorado Springs, Pueblo, and several Arkansas Valley towns, which supply facilities would be constructed by the United States only after construction by the communities themselves proves infeasible. These proposed works, which make up the initial development, are estimated to cost $147,440,000 on the basis of October 1949 price levels which are just slightly lower than present price levels. The cost of operation and maintenance, including reserves for replacement, is estimated to be $1,335,200 annually.

The initial development of the Gunnison-Arkansas project has engineering feasibility. It represents the minimum practical project. It is designed as a self-contained unit and its construction would not imply a commitment for expansion, extension, or enlargement; neither would it impair or duplicate future development. It would be operated in accordance with the principles set forth in the regional director's report. The Twin Lakes Reservoir & Canal Co. has expressed a willingness to execute the water exchange agreement which is prerequisite to the prevention of damage to the fisheries of the Roaring Fork River, and which is contemplated by the operating principles. The water to be imported from the Colorado River Watershed is to come from Colorado's apportionment under the upper Colorado River Basin compact, and there is sufficient water supply for the project.

The initial development of the Gunnison-Arkansas project is economically justified and financially feasible. The ratio of annual benefits to annual costs is about 1.7 to 1.0. Net annual revenues would amount to about $2,870,000. It is estimated that all reimbursable costs would be returned to the United States in 50 years. The tentative allocation of costs among the various purposes and the estimated payments are summarized in the following tabulation:

| Function | Allocation | Probable repayment |
|---|---|---|
| Reimbursable: | | |
| Irrigation | $59,930,000 | |
| Probably can be returned in 40 years without interest through payments by irrigation water users and district beneficiaries | | $10,881,600 |
| Probably can be returned in 40 years without interest through application of interest on power and municipal water investment | | 49,048,400 |
| Power | 40,032,000 | |
| Probably can be returned in 50 years with interest at 3 percent | | 40,032,000 |
| Municipal and industrial water supply | 29,522,000 | |
| Probably can be returned in 40 years with interest at 2 percent | | 29,522,000 |
| Total, reimbursable | 129,484,000 | 129,484,000 |
| Nonreimbursable: | | |
| Flood control | 15,777,000 | |
| Fish and wildlife | 2,179,000 | |
| Total, nonreimbursable | 17,956,000 | |
| Grand total | 147,440,000 | 129,484,000 |

Irrigation repayment will be accomplished under a contract with a water conservancy district. Municipal and industrial water repayment will be accomplished under contracts with this district or possibly another entity. Separate contracts will cover specific municipal water supply works if they are constructed by the United States and will require repayment of the cost of these works with interest over a period of 40 years. Power payments will be accomplished under contracts for furnishing electric energy at the lowest prices consistent with sound business principles in order to encourage the most widespread use of power throughout the area of service.

I concur in and adopt the recommendations of the regional director as set forth in his report.

I recommend that you approve and adopt this report as your proposed report on the initial development, Roaring Fork diversion, Gunnison-Arkansas project, Colorado, and that you authorize me, in your behalf, to transmit it to the Secretary of the Army; to the States signatory to the Colorado River compact, and to the States of Kansas and Oklahoma in accordance with the provisions of section 1 of the Flood Control Act of 1944 (58 Stat. 887); to the head of the agency of the State of Colorado exercising administration over the wildlife resources of that State, in accordance with the provisions of the act of August 14, 1946 (60 Stat. 1080); and to other interested Federal agencies for their views and comments.

Respectfully,

MICHAEL W. STRAUS, *Commissioner.*

Approved and adopted May 4, 1951.

OSCAR L. CHAPMAN,
*Secretary of the Interior.*

Senator MILLIKIN. The record will also include a letter from the Secretary of the Interior to the Vice President, dated June 9, 1953, regarding the project, together with a list of enclosures contained on a sheet which the reporter will include in the record together with the other material that comes with it.

(The documents referred to follow:)

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
*Washington, D. C., June 9, 1953.*

Hon. RICHARD M. NIXON,
*President of the Senate, Washington, D. C.*

MY DEAR MR. PRESIDENT: My report on the Fryingpan-Arkansas project, Colorado, is transmitted herewith pursuant to section 9 (a) of the Reclamation Project Act of 1939 (53 Stat. 1187).

The waters of the Arkansas River in the upper Arkansas River Basin are overappropriated, resulting in serious loss in crop production on presently irrigated farmland. Stabilized agricultural economy in the area requires supplemental water supplies. Additional quantity and better quality of domestic and municipal

water is critically needed in the Arkansas Valley, Colo. There is a need for additional electric energy in the project power market area and normal uses of electric energy would expand rapidly if not restricted by a limited supply. Floods in the upper Arkansas Valley threaten the loss of property and discourage investment. Sediment and pollution control are needed. The most pressing and immediate needs of the upper Arkansas River Basin can be met by the Fryingpan-Arkansas project which is herein recommended for authorization and construction.

The report has been transmitted to the States of the Colorado River Basin, to the States of Kansas and Oklahoma, and to the Secretary of the Army for their views and recommendations as required by the provisions of the Flood Control Act of 1944 (58 Stat. 887); to the State of Colorado for the comments of the head of the agency exercising administration over the wildlife resources of the State, as required by the provisions of the act of August 14, 1946 (60 Stat. 1080); and to the Departments of Agriculture and Commerce, the Federal Power Commission, the Corps of Engineers, and the Public Health Service, in accordance with interagency agreements. Copies of all the comments received are enclosed with the report.

The report and the comments received were submitted to the President and the Bureau of the Budget has advised that there would be no objection to the submittal of the report to the Congress. A copy of Assistant Budget Director Rowland Hughes' letter of June 8, 1953, is attached.

Sincerely yours,

RALPH A. TUDOR,
*Acting Secretary of the Interior.*

Enclosures to Secretary's report to the Congress—Fryingpan-Arkansas project, Colorado, are as follows:

1. Letter to the Secretary from Bureau of the Budget, June 8, 1953.
2. Secretary McKay's report to the President, through Bureau of Budget, April 30, 1953.
3. Former Secretary Chapman's report to the President, October 19, 1951.
4. Report of the Commissioner of Reclamation, dated September 11, 1951, and approved by the Secretary, October 19, 1951.
5. Proposed report of the Commissioner of Reclamation dated April 16, 1951, and approved by the Secretary, May 4, 1951.
6. Report of the regional director, Bureau of Reclamation, revised February 23, 1951.
7. Comments, Governor of Arizona, August 28, 1951.
8. Comments, California Department of Public Works, August 27, 1951.
9. Comments, Colorado Water Conservation Board, August 7, 1951.
10. Comments, Governor of Kansas, August 2, 1951.
11. Comments, Utah State engineer, June 5, 1951.
12. Comments, Wyoming Natural Resources Board, June 11, 1951.
13. Comments, Chief of Engineers, Department of the Army, September 26, 1951.
14. Comments, Department of Agriculture, May 23, 1952.
15. Comments, Department of Agriculture, October 10, 1951.
16. Comments, Department of Commerce, July 30, 1951.
17. Comments, Federal Power Commission, August 22, 1951.
18. Comments, Public Health Service, Federal Security Agency, August 16, 1951.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
*Washington 25, D. C., June 8, 1953.*

The honorable the SECRETARY OF THE INTERIOR.

MY DEAR MR. SECRETARY: Receipt is acknowledged of your letter of April 30, 1953, submitting your revised report on the Fryingpan-Arkansas project, Colorado, and requesting advice as to its relationship to the program of the President.

This proposed multipurpose project would provide irrigation, power, flood control, municipal water and other benefits. The plan contemplates several small powerplants and a system of canals, reservoirs, and tunnels to divert water from the western to the eastern slope of the Continental Divide and to produce better control and utilization of upper Arkansas River water.

The estimated cost is $172,898,000, of which $75,128,000 is allocated to irrigation, $41,945,000 to power, $32,654,000 to municipal water supply—reimbursable

items—and $20,341,000 to flood control and $2,830,000 to fish and wildlife—nonreimbursable items. The benefit-cost ratio is stated as 1.48 to 1.00.

The repayment plan contemplates that the power and municipal water supply investments would be entirely repaid with interest at 2½ percent in 53 and 63 years, respectively, or within 50 years after all facilities are placed in operation. The plan also contemplates that the irrigation investment would be returned without interest over a period of 69 years, in part from payments by irrigation water users and in part by revenues from power and municipal water supply after these latter investments are fully repaid. The irrigators would repay $622,000 annually for 69 years, based on an ad valorem tax of one mill and payments ranging from $5.40 per acre-foot for water diverted from the Colorado River Basin to $2.25 per acre-foot for reregulated Arkansas River winter flow. Irrigators now have prior water rights to the Arkansas River winter flow at no cost.

This office believes that a reasonable basis for appraising the repayment of Federal irrigation projects should be not more than 50 years, and that this would be consistent with the general practice of most Federal agencies in determining the economic evaluation and financial feasibility of water resources developments. On the basis of a 50-year repayment and the Department of the Interior's estimate of the water users' ability to repay, the water users would return $31,100,000 of the $75,128,000 allocated to irrigation, leaving unpaid at the end of 50 years $44,028,000, or 60 percent of the estimated construction cost. Thus, the water users would have paid $100 per acre out of a total investment of $243 per acre.

The proposed project report, on the other hand, contemplates repayment by the water users within 69 years rather than 50 years. During the additional 19 years, the above-mentioned balance of $44,028,000 would be repaid. Irrigators would pay $11,818,000, and the remainder of the unpaid construction cost amounting to $32,210,000 would be met from revenues on power and municipal water supply. As noted above, the allocation of costs to power and municipal water supply, under the proposed project, would be fully repaid with interest within 50 years after completion of all facilities. Revenues derived after the 50 years would be used to show repayment of the irrigation investment.

Federal and State agencies, in commenting on the original project report, questioned (1) the high cost of a limited supply of supplemental irrigation water, (2) the ability of the water users to repay annually as much of the irrigation costs as proposed, and (3) the ultimate amount of transmountain diversion and its effect on the quality and use of Colorado River water available to the lower basin. Notwithstanding the substantial increases in the estimated project costs and the greater estimate of the ability of the irrigators to repay, as shown in the revised report as compared with the original report, the comments of the States and Federal agencies have not been furnished on the revised report.

Approximately 63 percent of the irrigation benefits of the project are of an indirect character, consisting of additional business from increased purchases, marketing, and processing activities. Without these indirect benefits the project over a period of 50 years would not show a favorable benefit-cost ratio. While this office recognizes that there are definite indirect benefits, we believe that they should not be assigned a monetary value and should not be relied upon for the primary justification of a project. It is our understanding that this is in accord with your present views.

In the consideration of irrigation projects, it should be noted that, under existing law, the interest cost on the irrigation investment is not charged to the water users, but is borne by the Federal Government. In the case of the Fryingpan-Arkansas project, the average annual interest cost on the irrigation investment during the first 50 years would amount of about $1,500,000, on the basis of simple interest at 2½ percent, or approximately $5 per acre per year.

As indicated by the comments of the Department of Agriculture on the original report, under dates of October 10, 1951, and May 23, 1952, in view of the obvious high cost of importing water from the Colorado River Basin, a separate evaluation should be made of the feasibility of importing water from the Colorado River Basin, considered as an incremental addition rather than an integral part of the project. Furthermore, there is no evidence in the report indicating a willingness by the irrigators to repay the proposed charges for an average annual supplemental water supply of about one-half acre-foot per acre.

Plans for municipal water supplies appear doubtful because of the high water rates, optimistic estimates of average water deliveries, and uncertainty of including all proposed facilities and functions in the ultimate plans. We also believe that costs of correcting damages to fish and wildlife resources caused by the building of the project should be treated as part of the construction costs and allocated to the various purposes in the same manner as other damages, including relocations.

Our review indicates that further study of various aspects of the project might be warranted. If, however, you deem it advisable, particularly in the light of the committee's desire for an early hearing, there would be no objection to the transmittal of the report, together with a copy of this letter, for the consideration of the Congress.

Sincerely yours,

ROLAND HUGHES,
*Assistant Director.*

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
*Washington 25, D. C., April 30, 1953.*

Through: The Bureau of the Budget.

The PRESIDENT,
*The White House.*

MY DEAR MR. PRESIDENT: On October 19, 1951, my predecessor in office submitted his report on the Fryingpan-Arkansas project, Colorado, a multiple-purpose project for partial development of the water resources of the upper Arkansas River Basin and involving transmountain diversion of water from the Roaring Fork River, a tributary of the Colorado. By letter of January 27, 1953, Budget Director Dodge called my attention to this report, among others, and asked that it be reviewed to determine whether it conforms to the present program of the Department of the Interior, and whether any modification or revision should be made.

The report, as previously submitted, recommended immediate authorization for the construction and operation of a system of reservoirs, canals, tunnel, diversion dams, powerplants, and municipal water-supply facilities for irrigation and municipal water supply, flood control, power, sediment control, stream-pollution abatement, and preservation and propagation of fish and wildlife.

After review of the report and study of the data and information presently available, I have determined that no modification in the plan of development is required. However, the recommendations in the report are hereby modified to recommend, instead of the application of the so-called interest component as heretofore contemplated, the return of that part of the construction cost of the project which is allocated to irrigation and assigned to be repaid from net power and municipal water revenues subsequent to the repayment of the commerical power and municipal water investments—these latter investments to bear interest, on the unamortized balances, at a rate equal to the average rate paid by the United States on its long-term loans outstanding at the date of authorization of the project. We do not favor the use of the so-called interest component as an aid in paying out the irrigation costs of this project.

The repayments and economic analyses have been revised to reflect the increased costs since the basic report was prepared. Summaries of these revised studies are enclosed. The repayment analysis includes, as a part of the construction cost to be repaid, interest during construction on power and municipal water investments. In the economic analysis the power benefits are calculated on the basis of the value of power in the area and an analysis by functions is included.

The estimated cost of the Fryingpan-Arkansas project is $172,898,000 at January 1953 price levels. If the allocations are revised to incorporate the increased costs and the repayment plan is set up on the alternative basis hereinbefore suggested, with an interest rate estimated at 2.5 percent, return of irrigation costs which exceed those that can be repaid by the water users themselves could be accomplished in an overall period of 69 years or 17 additional years after the power investment is returned and 6 years after the municipal water investment is returned.

The revised economic analysis indicates that the benefits from construction of the project would exceed the costs in a ratio of 1.48 to 1.00 and that the inclusion of all functions is justified.

Supplemental water supplies, both for irrigation and for municipal use, are sorely needed in the Arkansas River Basin. Serious losses occur annually in crop production on presently irrigated farmland while the need for additional and better quality municipal water is fast becoming critical. Protection is needed against floods which result in extensive damages in the upper Arkansas Valley. Also, there is a need in the area for the electric energy from the project and normal uses for electricity would expand rapidly if not restricted by a limited supply.

This project and the report as herein modified conform to my program. Therefore, I transmit, pursuant to section 9 (a) of the Reclamation Project Act of 1939,

this report which incorporates the report of the previous Secretary of the Interior and the comments of the affected States and Federal agencies as my report on the Fryingpan-Arkansas project.

I shall appreciate receiving advice concerning the relationship of this project to your program before I transmit the report to the Congress in accordance with the provisions of the Reclamation Project Act of 1939.

Sincerely yours,

DOUGLAS MCKAY,
*Secretary of the Interior.*

TABLE I.—*Fryingpan-Arkansas project summary of benefit-cost analysis*

| *Item* | | *Amount* |
|---|---|---|
| Public investment: | | |
| Estimated construction costs | | $172, 898, 000 |
| Interest during construction [1] | | 6, 594, 000 |
| Total | | 479, 492, 000 |
| Annual costs: | | |
| Equivalent of public investment | | 4, 902, 000 |
| Operation, maintenance, and replacement: | | |
| Municipal water | $412, 000 | |
| Irrigation | 59, 000 | |
| Power | 842, 000 | |
| | | 1, 313, 000 |
| Regulation by upper Colorado storage project [2] | | 163, 000 |
| Total | | 6, 378, 000 |
| Annual benefits: | | |
| Municipal water | | 1, 662, 000 |
| Irrigation: [3] | | |
| Direct | $1, 598, 000 | |
| Indirect | 2, 757, 000 | |
| | | 4, 355, 000 |
| Power [4] | | 2, 702, 000 |
| Flood control [5] | | 598, 000 |
| Sediment control | | 141, 000 |
| Total | | 9, 458, 000 |
| Benefit-cost ratio: | | |
| Total benefits | | 1. 48:1. 00 |
| Direct benefits | | 1. 05:1. 00 |

[1] Interest during construction computations appearing in report have been reanalyzed; realistic construction periods were set up by features and made consistent with development periods.

[2] Annual cost of regulation provided by upper Colorado River storage project at $2.35 per acre-foot.

[3] Adjusted to 215 agricultural price index; excludes interests and wages shown in report as direct benefits to others; indirect benefits reflect increased marketing and processing activities and increases in farm purchases.

[4] Benefits reflect prospective value of power in area.

[5] Adjusted to reflect projected prices, Engineering News-Record Index of 180 (1939=100).

TABLE I–A.—*Fryingpan-Arkansas project summary of benefit-cost analysis by functions*

| Item | Total project | Municipal water | Irrigation | Power | Flood control | Fish and wildlife |
|---|---|---|---|---|---|---|
| Public investment: | | | | | | |
| Estimated construction costs | $172,898,000 | $32,654,000 | $75,128,000 | $41,945,000 | $20,341,000 | $2,830,000 |
| Interest during construction | 6,594,000 | 1,154,000 | 3,143,000 | 1,330,000 | 849,000 | 118,000 |
| Total | 179,492,000 | 33,808,000 | 78,271,000 | 43,275,000 | 21,190,000 | 2,948,000 |
| Annual costs: | | | | | | |
| Equivalent of public investment | 4,902,000 | 923,000 | 2,138,000 | 1,182,000 | 579,000 | 80,000 |
| Operation, maintenance, and replacement | 1,313,000 | 412,000 | 59,000 | 842,000 | ..... | ..... |
| Regulation by upper Colorado storage project [1] | 163,000 | ..... | ..... | ..... | ..... | ..... |
| Total | 6,378,000 | 1,335,000 | 2,197,000 | 2,024,000 | 579,000 | 80,000 |
| Annual benefits: [2] | | | | | | |
| Direct [2] | 6,701,000 | 1,662,000 | 1,598,000 | 2,702,000 | 598,000 | ..... |
| Indirect | 2,757,000 | ..... | 2,757,000 | ..... | ..... | ..... |
| Total | 9,458,000 | 1,662,000 | 4,355,000 | 2,702,000 | 598,000 | ..... |
| Benefit-cost ratio: | | | | | | |
| Total benefits | 1.48 | 1.24 | 1.98 | 1.33 | 1.03 | ..... |
| Direct benefits | 1.05 | 1.24 | .73 | 1.33 | 1.03 | ..... |

[1] Not distributed to functions.
[2] Includes $141,000 benefits from sediment control.

TABLE II.—*Fryingpan-Arkansas project—Segregation of costs*

| Feature | January 1953 construction costs | | | | | Annual operation, maintenance, and replacement | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Specific costs | | | Joint costs | Total | | | Specific operation, maintenance, and replacement | | Joint operation, maintenance and replacement |
| | | Power | Municipal water supply | Fish and wildlife [1] | | Operation and maintenance | 2½ percent-50-years replacement | Operation, maintenance and replacement | Power | Municipal water | |
| Aspen Dam and Reservoir | $8,102,000 | | | | $8,102,000 | $2,000 | $1,880 | $3,880 | | | $3,880 |
| Sugar Loaf Dam and Reservoir | 7,248,000 | | | | 7,248,000 | 2,760 | 1,680 | 4,440 | | | 4,440 |
| Twin Lakes Dam and Reservoir | 10,222,000 | | | | 10,222,000 | 3,900 | 2,370 | 6,270 | | | 6,270 |
| Salida Afterbay | 310,000 | $310,000 | | | | 1,870 | 70 | 1,940 | $1,940 | | |
| Pueblo Dam and Reservoir | 43,453,000 | | | | 43,453,000 | 6,200 | 10,090 | 16,290 | | | 16,290 |
| Main purification plant | 7,148,000 | | $7,148,000 | | | 33,750 | 10,290 | 44,040 | | $44,040 | |
| Pueblo pumping plant | 1,470,000 | | 1,470,000 | | | 93,320 | 18,340 | 111,660 | | 111,660 | |
| Colorado Springs pumping plant | 155,000 | | 155,000 | | | 4,780 | 1,930 | 6,710 | | 6,710 | |
| Hunter Creek-Aspen Canal | 288,000 | | | | 288,000 | 2,150 | 70 | 2,220 | | | 2,220 |
| Hunter Creek extension canal | 409,000 | | | $409,000 | | 4,700 | 90 | 4,790 | | | 4,790 |
| Southside collection system | 9,263,000 | | | 806,000 | 8,457,000 | 2,800 | | 2,800 | | | 2,800 |
| Northside collection system | 21,126,000 | | | 383,000 | 20,743,000 | 29,530 | 940 | 30,470 | | | 30,470 |
| Fryingpan-Arkansas tunnel | 10,111,000 | | | 1,232,000 | 8,879,000 | 3,030 | | 3,030 | | | 3,030 |
| Snowden Canal | 792,000 | | | | 792,000 | 7,000 | 180 | 7,180 | | | 7,180 |
| Arkansas Power Canal: | | | | | | | | | | | |
| Elbert Canal | 1,759,000 | 1,759,000 | | | | 26,250 | 410 | 26,660 | 26,660 | | |
| Twin Lakes-Otero Canal | 1,623,000 | 1,623,000 | | | | 11,460 | 380 | 11,840 | 11,840 | | |
| Otero-Wapaco Canal | 2,188,000 | 2,188,000 | | | | 15,470 | 510 | 15,980 | 15,980 | | |
| Wapaco diversion | 266,000 | 266,000 | | | | 1,990 | 60 | 2,050 | 2,050 | | |
| Wapaco-Princeton Canal | 2,466,000 | 2,466,000 | | | | 18,370 | 570 | 18,940 | 18,940 | | |
| Chalk Creek Diversion | 96,000 | 96,000 | | | | 720 | 20 | 740 | 740 | | |
| Princeton-Pancho Canal | 2,023,000 | 2,023,000 | | | | 15,100 | 470 | 15,570 | 15,570 | | |
| Pancho-Salida Canal | 2,508,000 | 2,508,000 | | | | 17,800 | 580 | 18,380 | 18,380 | | |
| Oil Creek-Brush Hollow Canal | 361,000 | | 361,000 | | | 4,390 | 80 | 4,470 | | 4,470 | |
| Pueblo water conduit | 1,735,000 | | 1,735,000 | | | 26,020 | 7,810 | 33,830 | | 33,830 | |
| Arkansas Valley water conduit | 10,631,000 | | 10,631,000 | | | 159,460 | 47,840 | 207,300 | | 207,300 | |
| Powerplants | 14,917,000 | 14,917,000 | | | | 378,540 | 161,510 | 540,050 | 540,050 | | |
| Powerplant switchyards | 3,885,000 | 3,885,000 | | | | 34,940 | 39,030 | 73,970 | 73,970 | | |
| Transmission lines | 5,079,000 | 5,079,000 | | | | 31,150 | 58,950 | 90,100 | 90,100 | | |
| Transmission substations | 2,091,000 | 2,091,000 | | | | 31,130 | 21,010 | 52,140 | 52,140 | | |
| General property | 1,173,000 | | | | 1,173,000 | | | | | | |
| Total | 172,898,000 | 39,211,000 | 21,500,000 | 2,830,000 | 109,357,000 | 970,580 | 387,160 | 1,357,740 | 868,360 | 408,010 | 81,370 |

[1] These amounts represent the costs of enlargement of the collection and diversion system specifically for fish and wildlife purposes. It is shown as a specific cost because the allocation to this function is limited to the costs of these added facilities totaling $2,830,000, as described in report of the regional director for mitigation of losses.

TABLE III.—*Fryingpan-Arkansas project cost allocation*

| Item | Total | Municipal water | Irrigation | Power | Flood control | Fish and wildlife |
|---|---|---|---|---|---|---|
| Annual benefits | $9,317,000 | $1,662,000 | $4,355,000 | $2,702,000 | $598,000 | |
| Less annual operation, maintenance, and replacement costs | 1,313,000 | 412,000 | 59,000 | 842,000 | 0 | 0 |
| Annual net benefits | 8,004,000 | 1,250,000 | 4,296,000 | 1,860,000 | 598,000 | |
| Justifiable investment | 295,910,000 | 45,771,000 | 157,305,000 | 68,107,000 | 21,897,000 | [1] $2,830,000 |
| Alternative expenditure | 184,161,000 | 33,575,000 | 81,097,000 | 42,148,000 | 27,341,000 | |
| Alternative justifiable expenditure | 181,547,000 | 33,575,000 | 81,097,000 | 42,148,000 | 21,897,000 | 2,830,000 |
| Less specific costs | 60,711,000 | 21,500,000 | 0 | 39,211,000 | 0 | |
| Remainder | 120,836,000 | 12,075,000 | 81,097,000 | 2,937,000 | 21,897,000 | |
| Percent distribution | 100.0 | 10.2 | 68.7 | 2.5 | 18.6 | |
| Joint costs | $112,187,000 | $11,154,000 | $75,128,000 | $2,734,000 | $20,341,000 | |
| Specific costs | 60,711,000 | 21,500,000 | 0 | 39,211,000 | 0 | $2,830,000 |
| Allocation | 172,898,000 | 32,654,000 | 75,128,000 | 41,945,000 | 20,341,000 | 2,830,000 |

[1] Incremental costs of features on western slope, as described in report of the regional director for mitigation of losses.

TABLE IV.—*Fryingpan-Arkansas project—Financial analysis, interest during construction*

| Feature | Code | Construction cost | Construction period | Interest at 2½ percent |
|---|---|---|---|---|
| Replacement reservoir, Aspen (28,000 acre-feet) | J | $8,102,000 | 4 | $405,100 |
| Sugar Loaf Reservoir enlargement (117,000 acre-feet) | J | 7,248,000 | 3 | 271,800 |
| Twin Lakes Reservoir enlargement (260,000 acre-feet) | J | 10,222,000 | 4 | 511,100 |
| Salida afterbay reservoir (200 acre-feet) | P | 310,000 | 1 | 3,900 |
| Pueblo Reservoir (400,000 acre-feet) | J | 43,453,000 | 4 | 2,172,600 |
| Main purification plant, Pueblo (7,500,000 gallons) | M | 7,148,000 | 2 | 178,700 |
| Hunter Creek diversion dam | J | 48,000 | 1 | 600 |
| Hunter Creek extension diversion works | J | 15,000 | 1 | 200 |
| Chapman Gulch diversion dam | J | 54,000 | 1 | 700 |
| Lime Creek diversion dam | J | 30,000 | 1 | 400 |
| Last Chance diversion dam | J | 30,000 | 1 | 400 |
| North Fork diversion dam | J | 30,000 | 1 | 400 |
| Ivanhoe diversion dam | J | 30,000 | 1 | 400 |
| Fryingpan River diversion dam | J | 16,000 | 1 | 200 |
| Snowden diversion dam | J | 205,000 | 2 | 5,100 |
| Wapaco diversion dam | P | 228,000 | 2 | 5,700 |
| Chalk Creek diversion dam | P | 62,000 | 1 | 800 |
| Oil Creek diversion dam | M | 138,000 | 1 | 1,700 |
| Main municipal pumping plant | M | 1,470,000 | 3 | 55,100 |
| Colorado Springs pumping plants | M | 155,000 | 2 | 3,900 |
| Hunter Creek-Aspen Canal (Q=200 cubic feet per second) | J | 240,000 | 1 | 3,000 |
| Hunter Creek extension canal (Q=20-100 cubic feet per second | J | 394,000 | 3 | 14,800 |
| South Side collection conduit | J | 9,209,000 | | |
| .01 Hunter Creek-Chapman tunnel | J | (2,578,000) | 2 | 64,400 |
| .02 Chapman-South Fork tunnel | J | (3,380,000) | 2 | 84,500 |
| .03 South Fork-Fryingpan siphon tunnel | J | (2,706,000) | 2 | 67,600 |
| .04 Fryingpan siphon | J | (545,000) | 1 | 6,800 |
| Northside collection conduit | J | 21,006,000 | | |
| .01 Lime Creek Canal | J | (1,182,000) | 3 | 44,300 |
| .02 Last Chance-North Fork section | J | (2,952,000) | 2 | 73,800 |
| .03 North Fork-Ivanhoe Creek section | J | (11,674,000) | 3 | 437,800 |
| .04 Ivanhoe Creek-Fryingpan siphon | J | (2,002,000) | 2 | 50,000 |
| .05 Fryingpan siphon-Fryingpan-Arkansas tunnel | J | (3,196,000) | | |
| Fryingpan-Arkansas divide tunnel | J | 10,095,000 | 3 | 378,600 |
| Elbert power canal | P | 1,795,000 | 3 | 67,300 |
| Snowden Canal | J | 587,000 | 2 | 14,700 |
| Twin Lakes-Otero Canal | P | 1,623,000 | 2 | 40,600 |
| Otero-Wapaco Canal | P | 2,188,000 | 3 | 82,000 |
| Wapaco diversion canal | P | 38,000 | 1 | 500 |
| Wapaco-Princeton Canal | P | 2,466,000 | 3 | 92,500 |
| Chalk Creek diversion canal | P | 34,000 | 1 | 400 |
| Princeton-Pancho Canal | P | 2,023,000 | 3 | 75,900 |
| Pancho-Salida Canal | P | 2,508,000 | 3 | 94,000 |
| Pueblo municipal water supply conduit | M | 1,735,000 | 2 | 43,400 |
| Arkansas Valley municipal water supply conduit | M | 10,631,000 | 3 | 398,700 |
| Oil Creek-Brush Hollow Canal | M | 223,000 | 3 | 8,400 |

TABLE IV.—*Fryingpan-Arkansas project—Financial analysis, interest during construction*—Continued

| Feature | Code | Construction cost | Construction period | Interest at 2½ percent |
|---|---|---|---|---|
| Elbert powerplant (8,700 kilowatts) | P | $1,137,000 | 3 | $42,600 |
| Otero (Granite) powerplant (19,200 kilowatts) | P | 2,711,000 | 3 | 101,700 |
| Wapaco powerplant (16,500 kilowatts) | P | 2,214,000 | 3 | 83,000 |
| Princeton powerplant (11,700 kilowatts) | P | 1,733,000 | 3 | 65,000 |
| Pancho (Princeton) powerplant (15,000 kilowatts) | P | 2,500,000 | 3 | 93,800 |
| Salida powerplant (22,700 kilowatts) | P | 2,908,000 | 3 | 109,000 |
| Pueblo powerplant (11,000 kilowatts) | P | 1,714,000 | 3 | 64,300 |
| Dillon-Elbert (51 miles) | P | 755,000 | 2 | 18,900 |
| Elbert-Otero (11 miles) | P | 127,000 | 1 | 1,600 |
| Otero-Wapaco (7 miles) | P | 104,000 | 1 | 1,300 |
| Wapaco-Princeton (15 miles) | P | 174,000 | 1 | 2,200 |
| Princeton-Pancho (7 miles) | P | 80,000 | 1 | 1,000 |
| Pancho-Salida (3 miles) | P | 35,000 | 1 | 400 |
| Gunnison-Salida (66 miles) | P | 1,020,000 | 2 | 25,500 |
| Saguache-Salida (47 miles) | P | 504,000 | 2 | 12,600 |
| Salida-Pueblo (97 miles) | P | 1,124,000 | 2 | 28,100 |
| Pueblo-Colorado Springs (44 miles) | P | 472,000 | 1 | 5,900 |
| Colorado Springs-Limon (73 miles) | P | 684,000 | 2 | 17,100 |
| Leadville (15,000 kilovolt-amperes) | P | 118,000 | 1 | 1,500 |
| Salida (5,000 kilovolt-amperes) | P | 139,000 | 1 | 1,700 |
| Gunnison (3,750 kilovolt-amperes) | P | 253,000 | 1 | 3,200 |
| Saguache (10,000 kilovolt-amperes) | P | 149,000 | 1 | 1,900 |
| Canon City (15,000 kilovolt-amperes) | P | 302,000 | 1 | 3,800 |
| Pueblo (25,000 kilovolt-amperes) | P | 205,000 | 1 | 2,600 |
| Colorado Springs (30,000 kilovolt-amperes) | P | 925,000 | 1 | 11,600 |
| Elbert (9,670 kilovolt-amperes) | P | 482,000 | 1 | 6,000 |
| Otero (21,330 kilovolt-amperes) | P | 558,000 | 1 | 7,000 |
| Wapaco (18,330 kilovolt-amperes) | P | 540,000 | 1 | 6,800 |
| Princeton (13,000 kilovolt-amperes) | P | 507,000 | 1 | 6,400 |
| Pancho (16,670 kilovolt-amperes) | P | 434,000 | 1 | 5,400 |
| Salida (25,220 kilovolt-amperes) | P | 770,000 | 1 | 9,600 |
| Pueblo (12,220 kilovolt-amperes) | P | 594,000 | 1 | 7,400 |
| General communication system | J | 105,000 | 2 | 2,600 |
| General service equipment (25 percent construction facilities) | J | 1,053,000 | 7 | 79,000 |
| Gunnison maintenance shop | J | 15,000 | 1 | 200 |
| Total | | 172,898,000 | | 6,593,500 |

Code:
J=Joint.
P=Power.
M=Municipal water.

TABLE V.—*Fryingpan-Arkansas project—Revised financial study No. 3*

| Year of study | Power | | | | | | | Municipal and industrial water supply | | | | | Irrigation | | Recapitulation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net operating revenues | Repayable components of net power revenues | | Investment repayment | | | | Net revenues from municipal and industrial water supply | Repayment components of net revenues | | Investment repayment of municipal and industrial water plant | Irrigation plant paid by municipal water revenues | Net revenues (including conservancy district tax) | Investment repayment, interest free balance to be repaid | Net project revenues | Earned surplus |
| | | | | Interest bearing | | Interest free | | | | | | | | | | |
| | | Interest 2½ percent | Excess over interest | Electric plant | Balance to be repaid | Irrigation plant paid by power revenues | | | Interest 2½ percent | Excess over interest | | | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| | | | | | | | | | | | $13,898,000 | $6,738,000 | | $42,918,000 | | |
| | | | | $21,553,000 | $21,553,000 | $25,472,000 | | | | | | | | | | |
| 0 | | | | 28,376,000 | 28,185,835 | 25,472,000 | | $591,430 | $347,450 | $243,980 | 13,654,020 | 6,738,000 | $622,000 | 42,296,000 | $1,942,420 | |
| 1 | $728,990 | $538,825 | $190,165 | 35,019,000 | 34,636,121 | 25,472,000 | | 591,430 | 341,350 | 250,080 | 13,403,940 | 6,838,000 | 622,000 | 41,674,000 | 2,110,790 | |
| 2 | 897,360 | 704,646 | 192,714 | 39,317,000 | 38,443,274 | 25,472,000 | | 591,430 | 335,098 | 256,332 | 13,147,608 | 6,738,000 | 622,000 | 41,052,000 | 2,570,180 | |
| 3 | 1,356,750 | 865,903 | 490,847 | 39,317,000 | 37,977,036 | 25,472,000 | | 591,430 | 328,690 | 262,740 | 12,884,868 | 6,738,000 | 622,000 | 40,430,000 | 2,640,750 | |
| 4 | 1,427,320 | 961,082 | 466,238 | 39,317,000 | 37,499,142 | 25,472,000 | | 591,430 | 322,122 | 269,308 | 16,880,560 | 6,738,000 | 622,000 | 39,808,000 | 2,640,750 | |
| 5 | 1,427,320 | 949,426 | 477,894 | 39,317,000 | 37,009,301 | 25,472,000 | | 714,700 | 422,014 | 292,686 | 16,587,874 | 6,738,000 | 622,000 | 39,186,000 | 2,764,020 | |
| 6 | 1,427,320 | 937,479 | 489,841 | 39,317,000 | 36,507,214 | 25,472,000 | | 714,700 | 414,697 | 300,003 | 16,287,871 | 6,738,000 | 622,000 | 38,564,000 | 2,764,020 | |
| 7 | 1,427,320 | 925,233 | 502,087 | 39,317,000 | 35,992,574 | 25,472,000 | | 714,700 | 407,197 | 307,503 | 15,980,368 | 6,738,000 | 622,000 | 37,942,000 | 2,764,020 | |
| 8 | 1,427,320 | 912,680 | 514,640 | 39,317,000 | 39,423,068 | 25,472,000 | | 714,700 | 399,509 | 315,191 | 15,665,177 | 6,738,000 | 622,000 | 37,320,000 | 2,764,020 | |
| 9 | 1,427,320 | 899,814 | 527,506 | 43,275,000 | 38,904,245 | 25,472,000 | | 714,700 | 391,629 | 323,071 | 23,686,106 | 6,738,000 | 622,000 | 36,698,000 | 2,841,100 | |
| 10 | 1,504,400 | 985,577 | 518,823 | 43,275,000 | 38,372,451 | 25,472,000 | | 899,140 | 592,153 | 306,987 | 28,757,119 | 6,738,000 | 622,000 | 36,076,000 | 3,025,540 | |
| 11 | 1,504,400 | 972,606 | 531,794 | 43,275,000 | 37,827,362 | 25,472,000 | | 1,015,120 | 718,928 | 296,192 | 28,460,927 | 6,738,000 | 622,000 | 35,054,000 | 3,141,520 | |
| 12 | 1,504,400 | 959,311 | 545,089 | 43,275,000 | 37,268,645 | 25,472,000 | | 1,015,120 | 711,523 | 303,597 | 30,080,330 | 6,738,000 | 622,000 | 34,832,000 | 3,141,520 | |
| 13 | 1,504,400 | 945,683 | 558,717 | 43,275,000 | 36,695,959 | 25,472,000 | | 1,064,190 | 752,008 | 312,182 | 29,768,148 | 6,738,000 | 622,000 | 34,210,000 | 3,190,590 | |
| 14 | 1,504,400 | 931,714 | 572,686 | 43,275,000 | 36,108,955 | 25,472,000 | | 1,064,190 | 744,203 | 319,987 | 29,448,161 | 6,738,000 | 622,000 | 33,588,000 | 3,190,590 | |
| 15 | 1,504,400 | 917,396 | 587,004 | 43,275,000 | 35,507,276 | 25,472,000 | | 1,064,190 | 736,203 | 327,987 | 29,120,174 | 6,738,000 | 622,000 | 32,966,000 | 3,190,590 | |
| 16 | 1,504,400 | 902,721 | 601,679 | 43,275,000 | 34,890,555 | 25,472,000 | | 1,064,190 | 728,002 | 336,188 | 28,783,986 | 6,738,000 | 622,000 | 32,344,000 | 3,190,590 | |
| 17 | 1,504,400 | 887,679 | 616,721 | 43,275,000 | 34,258,416 | 25,472,000 | | 1,064,190 | 719,597 | 344,593 | 28,439,393 | 6,738,000 | 622,000 | 31,722,000 | 3,190,590 | |
| 18 | 1,504,400 | 872,261 | 632,139 | 43,275,000 | 33,610,473 | 25,472,000 | | 1,064,190 | 710,982 | 353,208 | 28,086,185 | 6,738,000 | 622,000 | 31,100,000 | 3,190,590 | |
| 19 | 1,504,400 | 856,457 | 647,943 | 43,275,000 | 32,946,331 | 25,472,000 | | 1,064,190 | 702,152 | 362,038 | 27,724,147 | 6,738,000 | 622,000 | 30,478,000 | 3,190,590 | |
| 20 | 1,504,400 | 840,258 | 664,142 | 43,275,000 | 32,265,585 | 25,472,000 | | 1,064,190 | 693,101 | 371,089 | 27,353,058 | 6,738,000 | 622,000 | 29,856,000 | 3,190,590 | |
| 21 | 1,504,400 | 823,654 | 680,746 | 42,275,000 | 31,567,820 | 25,472,000 | | 1,064,190 | 683,823 | 380,367 | 26,972,691 | 6,738,000 | 622,000 | 29,234,000 | 3,190,590 | |
| 22 | 1,504,400 | 806,635 | 697,765 | 43,275,000 | 30,852,610 | 25,472,000 | | 1,064,190 | 674,313 | 389,877 | 26,582,814 | 6,738,000 | 622,000 | 28,612,000 | 3,190,590 | |
| 23 | 1,504,400 | 789,190 | 715,210 | 43,275,000 | 30,119,519 | 25,472,000 | | 1,064,190 | 664,565 | 399,625 | 26,183,189 | 6,738,000 | 622,000 | 27,990,000 | 3,190,590 | |
| 24 | 1,504,400 | 771,309 | 733,091 | 43,275,000 | 29,368,100 | 25,472,000 | | 1,064,190 | 654,574 | 409,616 | 25,773,573 | 6,738,000 | 622,000 | 27,368,000 | 3,190,590 | |
| 25 | 1,504,400 | 752,981 | 751,419 | 43,275,000 | 28,597,895 | 25,472,000 | | 1,064,190 | 644,333 | 419,857 | 25,353,716 | 6,738,000 | 622,000 | 26,746,000 | 3,190,590 | |
| 26 | 1,504,400 | 734,195 | 770,205 | 43,275,000 | 27,808,434 | 25,472,000 | | 1,064,190 | 633,836 | 430,354 | 24,923,362 | 6,738,000 | 622,000 | 26,124,000 | 3,190,590 | |
| 27 | 1,504,400 | 714,939 | 789,461 | 43,275,000 | 26,999,236 | 25,472,000 | | 1,064,190 | 623,077 | 441,113 | 24,482,249 | 6,738,000 | 622,000 | 25,502,000 | 3,190,590 | |
| 28 | 1,504,400 | 695,202 | 809,198 | 43,275,000 | 26,169,808 | 25,472,000 | | 1,064,190 | 612,048 | 452,142 | 24,030,107 | 6,738,000 | 622,000 | 24,880,000 | 3,190,590 | |
| 29 | 1,504,400 | 674,972 | 829,428 | | | | | | | | | | | | | |

TABLE V.—*Fryingpan-Arkansas project—Revised financial study No. 3*—Continued

| Year of study | Power | | | | | | Municipal and industrial water supply | | | | Irrigation | Recapitulation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net operating revenues | Repayable components of net power revenues | | Investment repayment | | | Net revenues from municipal and industrial water supply | Repayable components of net revenues | | Investment repayment of municipal and industrial water plant | Irrigation plant paid by municipal water revenues | Net revenues (including conservancy district tax) | Investment repayment, interest free balance to be repaid | Net project revenues | Earned surplus |
| | | | | Interest bearing | | Interest free | | | | | | | | | |
| | | Interest 2½ percent | Excess over interest | Electric plant | Balance to be repaid | Irrigation plant paid by power revenues | | Interest 2½ percent | Excess over interest | | | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| 30 | $1,504,400 | $654,236 | $850,164 | $43,275,000 | $25,319,644 | $25,472,000 | $1,064,190 | $600,744 | $463,446 | $23,566,661 | $6,738,000 | $622,000 | $24,258,000 | $3,190,590 | |
| 31 | 1,504,400 | 632,981 | 871,419 | 43,275,000 | 24,448,225 | 25,472,000 | 1,064,190 | 589,158 | 475,032 | 23,091,629 | 6,738,000 | 622,000 | 23,636,000 | 3,190,590 | |
| 32 | 1,504,400 | 611,195 | 893,205 | 43,275,000 | 23,555,020 | 25,472,000 | 1,064,190 | 577,282 | 486,908 | 22,604,721 | 6,738,000 | 622,000 | 23,014,000 | 3,190,590 | |
| 33 | 1,504,400 | 588,854 | 915,536 | 43,275,000 | 22,639,484 | 25,472,000 | 1,064,190 | 565,109 | 499,081 | 22,105,640 | 6,738,000 | 622,000 | 22,392,000 | 3,190,590 | |
| 34 | 1,504,400 | 565,976 | 938,424 | 43,275,000 | 21,701,060 | 25,472,000 | 1,064,190 | 552,631 | 511,559 | 21,594,081 | 6,738,000 | 622,000 | 21,770,000 | 3,190,590 | |
| 35 | 1,504,400 | 542,515 | 961,885 | 43,275,000 | 20,739,175 | 25,472,000 | 1,064,190 | 539,842 | 524,348 | 21,069,733 | 6,738,000 | 622,000 | 21,148,000 | 3,190,590 | |
| 36 | 1,504,400 | 518,468 | 985,932 | 43,275,000 | 19,753,243 | 25,472,000 | 1,064,190 | 526,733 | 537,457 | 20,532,276 | 6,738,000 | 622,000 | 20,526,000 | 3,190,590 | |
| 37 | 1,504,400 | 493,820 | 1,010,580 | 43,275,000 | 18,742,663 | 25,472,000 | 1,064,190 | 513,296 | 550,894 | 19,981,382 | 6,738,000 | 622,000 | 19,904,000 | 3,190,590 | |
| 38 | 1,504,400 | 468,555 | 1,035,845 | 43,275,000 | 17,706,818 | 25,472,000 | 1,064,190 | 499,524 | 564,666 | 19,416,716 | 6,738,000 | 622,000 | 19,282,000 | 3,190,590 | |
| 39 | 1,504,400 | 442,658 | 1,061,742 | 43,275,000 | 16,645,076 | 25,472,000 | 1,064,190 | 485,407 | 578,783 | 18,837,933 | 6,738,000 | 622,000 | 18,660,000 | 3,190,590 | |
| 40 | 1,504,400 | 416,114 | 1,088,286 | 43,275,000 | 15,556,790 | 25,472,000 | 1,064,190 | 470,937 | 593,253 | 18,244,680 | 6,738,000 | 622,000 | 18,038,000 | 3,190,590 | |
| 41 | 1,504,400 | 388,906 | 1,115,494 | 43,275,000 | 14,441,296 | 25,472,000 | 1,064,190 | 456,105 | 608,085 | 17,636,595 | 6,738,000 | 622,000 | 17,416,000 | 3,190,590 | |
| 42 | 1,504,400 | 361,018 | 1,143,382 | 43,275,000 | 13,297,914 | 25,472,000 | 1,064,190 | 440,903 | 623,287 | 17,013,308 | 6,738,000 | 622,000 | 16,794,000 | 3,190,590 | |
| 43 | 1,504,400 | 332,433 | 1,171,967 | 43,275,000 | 12,125,947 | 25,472,000 | 1,064,190 | 425,321 | 638,869 | 16,374,439 | 6,738,000 | 622,000 | 16,172,000 | 3,190,590 | |
| 44 | 1,504,400 | 303,133 | 1,201,267 | 43,275,000 | 10,924,680 | 25,472,000 | 1,064,190 | 409,349 | 654,841 | 15,719,598 | 6,738,000 | 622,000 | 15,550,000 | 3,190,590 | |
| 45 | 1,504,400 | 273,100 | 1,231,300 | 43,275,000 | 9,693,380 | 25,472,000 | 1,064,190 | 392,978 | 671,212 | 15,048,386 | 6,738,000 | 622,000 | 14,928,000 | 3,190,590 | |
| 46 | 1,504,400 | 242,317 | 1,262,083 | 43,275,000 | 8,431,297 | 25,472,000 | 1,064,190 | 376,198 | 687,992 | 14,360,394 | 6,738,000 | 622,000 | 14,306,000 | 3,190,590 | |
| 47 | 1,504,400 | 210,765 | 1,293,635 | 43,275,000 | 7,137,662 | 25,472,000 | 1,064,190 | 358,998 | 705,192 | 13,655,202 | 6,738,000 | 622,000 | 13,684,000 | 3,190,590 | |
| 48 | 1,504,400 | 178,424 | 1,325,976 | 43,275,000 | 5,811,686 | 25,472,000 | 1,064,190 | 341,368 | 722,822 | 12,932,380 | 6,738,000 | 622,000 | 13,062,000 | 3,190,590 | |
| 49 | 1,504,400 | 145,274 | 1,359,126 | 43,275,000 | 4,452,560 | 25,472,000 | 1,064,190 | 323,296 | 740,894 | 12,191,486 | 6,738,000 | 622,000 | 12,440,000 | 3,190,590 | |
| 50 | 1,504,400 | 111,295 | 1,393,105 | 43,275,000 | 3,059,455 | 25,472,000 | 1,064,190 | 304,773 | 759,417 | 11,432,069 | 6,738,000 | 622,000 | 11,818,000 | 3,190,590 | |
| 51 | 1,504,400 | 76,467 | 1,427,933 | 43,275,000 | 1,631,522 | 25,472,000 | 1,064,190 | 285,788 | 778,402 | 10,653,667 | 6,738,000 | 622,000 | 11,196,000 | 3,190,590 | |
| 52 | 1,504,400 | 40,769 | 1,463,631 | 43,275,000 | 167,891 | 25,472,000 | 1,064,190 | 266,328 | 797,862 | 9,855,805 | 6,738,000 | 622,000 | 10,574,000 | 3,190,590 | |
| 53 | 1,504,400 | 4,197 | 167,891 | 43,275,000 | 0 | 24,139,688 | 1,064,190 | 246,381 | 817,809 | 9,037,996 | 6,738,000 | 622,000 | 9,952,000 | 3,190,590 | |
| 54 | 1,504,400 | | | 43,275,000 | | 22,635,288 | 1,064,190 | 225,936 | 838,254 | 8,199,742 | 6,738,000 | 622,000 | 9,330,000 | 3,190,590 | |
| 55 | 1,504,400 | | | 43,275,000 | | 21,130,888 | 1,064,190 | 204,980 | 859,210 | 7,340,532 | 6,738,000 | 622,000 | 8,708,000 | 3,190,590 | |
| 56 | 1,504,400 | | | 43,275,000 | | 19,625,488 | 1,064,190 | 183,499 | 880,691 | 6,459,841 | 6,738,000 | 622,000 | 8,086,000 | 3,190,590 | |
| 57 | 1,504,400 | | | 43,275,000 | | 18,122,088 | 1,064,190 | 161,481 | 902,709 | 5,557,132 | 6,738,000 | 622,000 | 7,464,000 | 3,190,590 | |
| 58 | 1,504,400 | | | 43,275,000 | | 16,617,688 | 1,064,190 | 138,913 | 925,277 | 4,631,855 | 6,738,000 | 622,000 | 6,842,000 | 3,190,590 | |
| 59 | 1,504,400 | | | 43,275,000 | | 15,113,288 | 1,064,190 | 115,781 | 948,409 | 3,683,446 | 6,738,000 | 622,000 | 6,220,000 | 3,190,590 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 1,504,400 | | | 43,275,000 | | 13,608,888 | 1,064,190 | 92,071 | 972,119 | 2,711,327 | 6,738,000 | 622,000 | 5,598,000 | 3,190,590 | |
| 61 | 1,504,400 | | | 43,275,000 | | 12,104,488 | 1,064,190 | 67,768 | 996,422 | 1,714,905 | 6,738,000 | 622,000 | 4,976,000 | 3,190,590 | |
| 62 | 1,504,400 | | | 43,275,000 | | 10,600,088 | 1,064,190 | 42,858 | 1,021,332 | 693,573 | 6,738,000 | 622,000 | 4,354,000 | 3,190,590 | |
| 63 | 1,504,400 | | | 43,275,000 | | 9,095,688 | 1,064,190 | 17,324 | 693,573 | 0 | 6,384,707 | 622,000 | 3,732,000 | 3,190,590 | |
| 64 | 1,504,400 | | | 43,275,000 | | 7,591,288 | 1,064,190 | | | | 5,320,517 | 622,000 | 3,110,000 | 3,190,590 | |
| 65 | 1,504,400 | | | 43,275,000 | | 6,086,888 | 1,064,190 | | | | 4,256,327 | 622,000 | 2,488,000 | 3,190,590 | |
| 66 | 1,504,400 | | | 43,275,000 | | 4,582,488 | 1,064,190 | | | | 3,192,137 | 622,000 | 1,866,000 | 3,190,590 | |
| 67 | 1,504,400 | | | 43,275,000 | | 3,078,088 | 1,064,190 | | | | 2,127,947 | 622,000 | 1,244,000 | 3,190,590 | |
| 68 | 1,504,400 | | | 43,275,000 | | 1,573,688 | 1,064,190 | | | | 1,063,757 | 622,000 | 622,000 | 3,190,590 | |
| 69 | 1,504,400 | | | 43,275,000 | | 69,288 | 1,063,757 | | | | 0 | 622,000 | 0 | 3,190,157 | |
| 70 | 1,504,400 | | | 43,275,000 | | 0 | | | | | | | | 1,504,400 | $1,435,112 |
| Total | 103,315,420 | 33,133,308 | 43,275,000 | 43,275,000 | 0 | 0 | 69,054,037 | 28,508,237 | 33,808,000 | 0 | 0 | 42,918,000 | 0 | 215,287,657 | 1,435,112 |

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
*Washington, D. C., October 19, 1951.*

Through: Bureau of the Budget.

The PRESIDENT,
*The White House.*

MY DEAR MR. PRESIDENT: My report on the Fryingpan-Arkansas project, Colorado, is transmitted herewith pursuant to section 9 (a) of the Reclamation Project Act of 1939 (53 Stat. 1187).

The waters of the Arkansas River in the upper Arkansas River Basin are overappropriated, resulting in serious loss in crop production on presently irrigated farmland. Stabilized agricultural economy in the area requires supplemental water supplies. Additional quantity and better quality of domestic and municipal water is critically needed in the Arkansas Valley, Colo. There is a need for additional electric energy in the project power market area and normal uses of electric energy would expand rapidly if not restricted by a limited supply. Floods in the upper Arkansas Valley threaten the loss of property and discourage investment. Sediment and pollution control are needed. The most pressing and immediate needs of the upper Arkansas River Basin can be met by the Fryingpan-Arkansas project which is herein recommended for authorization and construction.

The report has been transmitted to the States of the Colorado River Basin, to the States of Kansas and Oklahoma, and to the Secretary of the Army for their views and recommendations as required by the provisions of the Flood Control Act of 1944 (58 Stat. 887); to the State of Colorado for the comments of the head of the agency exercising administration over the wildlife resources of the State, as required by the provisions of the act of August 14, 1946 (60 Stat. 1080); and to the Departments of Agriculture and Commerce, the Federal Power Comission, the Corps of Engineers, and the Public Health Service, in accordance with interagency agreements. Copies of all the comments received are enclosed with the report.

I shall appreciate having advice concerning the relationship of this proposed project to your program before I transmit the report to the Congress for its consideration and appropriate action in accordance with the provisions of the Reclamation Project Act of 1939.

Sincerely yours,

OSCAR L. CHAPMAN,
*Secretary of the Interior.*

UNITED STATES DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
*Washington, D. C., September 11, 1951.*

THE SECRETARY OF THE INTERIOR.

SIR: This is my report on the Fryingpan-Arkansas project, Colorado, formerly called the initial development, Roaring Fork diversion, Gunnison-Arkansas project.

In your behalf, copies of the report on this project, which you approved and adopted as your proposed report on May 4, 1951, were sent to the Secretary of the Army and to designated officials of the States of Arizona, California, Colorado, Kansas, Nevada, New Mexico, Oklahoma, Utah, and Wyoming for their views and recommendations in accordance with the provisions of section 1 of the Flood Control Act of 1944 (58 Stat. 887), and to the Governor of Colorado for the report and recommendations of the head of the agency exercising administration over the wildlife resources of the State of Colorado in accordance with the requirements of the act of August 14, 1946 (60 Stat. 1080). Copies of the proposed report were sent also to the Federal Power Commission, the Departments of Agriculture and Commerce, the Corps of Engineers, and the Public Health Service for their comments. Copies of the written views of the States and of the Federal agencies which have been received in response to these transmittals are attached with a copy of your proposed report.

The reviewing officials of Colorado, which is the State directly affected, concur in the findings of the project report that the products and services which this proposed development would provide or make possible are greatly needed and that the project is engineeringly feasible, economically justified, and financially feasible. They approve the proposed development conditioned upon compliance with the operating principles set forth in the report and full recognition of and compliance with certain portions, quoted in Colorado's letter of comments, of the report of

Colorado Water Conservation Board's policy and review committee as it was approved by the board on February 22, 1951. We approve of the proposed operating principles and have every intention of complying with them if and when the project is authorized, constructed, and in operation. Colorado objects to the name heretofore given the project and recommends that it be known and referred to as the Fryingpan-Arkansas project. As this development is designed as a self-contained unit and its construction would not imply a commitment to develop future water supplies in the Gunnison River Basin for diversion to the Arkansas River Basin, as the diversion is from the Fryingpan River to the Arkansas River, and in view of the desires of the State of Colorado, I recommend that this proposed development, identified in your proposed report as the initial development, Roaring Fork diversion, Gunnison-Arkansas project, be hereafter known as the Fryingpan-Arkansas project.

The State of Kansas, which is a party to the Arkansas River compact and has a strong interest in any proposed development and use of the water of that stream, has no objection to the development as set forth in the project report.

The States of Arizona, California, Utah, and Wyoming have no objection to the authorization and construction of this project.

The Public Health Service suggests revision of statements relative to water pollution in the Arkansas River Valley. As these revisions are based on data compiled in recent joint studies by the Public Health Service and the State of Colorado, I have no objection to this suggestion and recommend that, by this reference, the report be considered modified as suggested by the Public Health Service in its attached letter of comments.

Other comments have been made which are set forth in the attached digest. The 90-day period specified by law for receipt of comments on this report expired on August 16, 1951. Submittal of the report to you was deferred until now in anticipation that additional comments would be received. If other comments are received, they will be forwarded to you.

After consideration of all comments received, I recommend that your proposed report be modified only as set forth above; that you adopt as your final report on the Fryingpan-Arkansas project the report which you approved and adopted as your proposed report on May 4, 1951, with the above modifications; and that you transmit it, together with copies of the attached comments, to the President and, subsequently, to the Congress in accordance with the provisions of the Reclamation Project Act of 1939.

Respectfully,

MICHAEL W. STRAUS, *Commissioner.*

Approved and adopted: October 19, 1951.

OSCAR L. CHAPMAN,
*Secretary of the Interior.*

OFFICE OF THE GOVERNOR,
*Phoenix, Ariz., August 28, 1951.*

Mr. MICHAEL STRAUS,
*Commissioner of Reclamation,*
*Department of the Interior, Washington, D. C.*

DEAR MR. STRAUS: At my request the Arizona Interstate Stream Commission examined your project planning report No. 7–8a.49–1 on the initial development of the Gunnison-Arkansas project, Roaring Fork diversion, Colorado.

I have received their comments, which I hereby adopt as the official comments of the State of Arizona, and enclose herewith copy of their letter.

Sincerely yours,

HOWARD PYLE, *Governor.*

ARIZONA INTERSTATE STREAM COMMISSION,
*Phoenix, Ariz., August 28, 1951.*

Hon. HOWARD PYLE,
*Governor of Arizona,*
*State House, Phoenix, Ariz.*

DEAR GOVERNOR PYLE: We have examined project planning report No. 7–8a.49–1 of the Department of the Interior, Bureau of Reclamation, region 7, on the initial development of the Gunnison-Arkansas project, Roaring Fork diversion in Colorado.

We have not attempted any detailed analysis of engineering features or financial studies, but have concerned ourselves solely with the question of the diversion of

69,000 acre-feet of water from the headwaters of the Roaring Fork River to the Arkansas River Basin.

That quantity of water falls clearly within the right of the State of Colorado to the use of Colorado River water as agreed in the upper Colorado River Basin compact.

The State of Arizona, of course, is not concerned where water is used within the State of Colorado so long as it is within the share of that State. Accordingly, we have no objection to the subject report or the diversion of the quantity of water indicated above.

Respectfully yours,

ARIZONA INTERSTATE STREAM COMMISSION,
By WAYNE M. AKIN, *Chairman*,
RAY KILLIAN, *Secretary*.

EARL WARREN
Governor
STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS,
*Sacramento, August 27, 1951.*

Hon. OSCAR L. CHAPMAN,
*Secretary of the Interior, Washington, D. C.*

MY DEAR MR. SECRETARY: Your proposed report on the initial development (Roaring Fork diversion), of the potential Gunnison-Arkansas project, Colo., dated May 4, 1951, was received on May 15, 1951, and on May 16, was transmitted to the division of water resources of this department for review and report thereon. On May 17, the State engineer, chief of the division of water resources, forwarded copies of this report to the Colorado River Board of California for consideration by that board.

The report of the State engineer has been received and is transmitted herewith in accordance with the provisions of Public Law 534, 78th Congress, 2d session. Also transmitted herewith for your consideration are the comments of the Colorado River Board of California.

I concur in the comments of the State engineer and request that they be considered as expressing the views and recommendations of the State of California on your proposed report on initial development (Roaring Fork diversion), Gunnison-Arkansas project, Colo. It is further respectfully requested that the report of the State engineer, dated August 27, 1951, and the comments of the Colorado River Board of California on this subject be transmitted to the President of the United States and to the Congress along with the other material that may be so transmitted.

Very truly yours,

FRANK B. DURKEE,
*Director of Public Works.*

STATEMENT OF THE STATE OF CALIFORNIA ON PROPOSED REPORT OF THE SECRETARY OF THE INTERIOR ENTITLED "INITIAL DEVELOPMENT, ROARING FORK DIVERSION, GUNNISON-ARKANSAS PROJECT, COLO."

INTRODUCTION

The Commissioner of Reclamation by letter, dated May 8, 1951, transmitted to the director of public works, for the views and recommendations of the State of California the proposed report of the Secretary of the Interior on the initial development (Roaring Fork diversion), Gunnison-Arkansas project, Colo. (Project Planning Rept. No. 7–8a.49–1), approved and adopted by the Secretary on May 4, 1951.

The report was received in the office of the director of public works on May 15, 1951, and referred on May 16, 1951 to the State engineer, who is the chief of the division of water resources, for review and report. On May 17, 1951, two copies of the report of the Secretary of the Interior were transmitted by the State engineer to the Colorado River Board of California for comment.

The proposed report of the Secretary of the Interior comprises (*a*) a letter, dated April 16, 1951, from the Commissioner of Reclamation to the Secretary of the Interior, approved and adopted by the Secretary of the Interior on May 4, 1951; (*b*) report of the regional director, region 7, United States Bureau of Reclamation,

dated July 5, 1950, and revised February 23, 1951; and (*c*) a substantiating report including reports by cooperating agencies.

The proposed initial development (Roaring Fork diversion) is a feature of the potential Gunnison-Arkansas project, a major unit in the comprehensive plan of development of the water resources of the Upper Arkansas River Basin. The initial development is a multipurpose project involving the diversion of water at elevation 8,100 feet from the Roaring Fork, a tributary of the Colorado, to the Arkansas River, a tributary of the Mississippi River.

The features of the project of the initial development as set forth in the proposed report of the Secretary of the Interior, comprise the following:

"(*a*) A system of about 50 miles of canals and tunnels on the western slope of the Continental Divide for the collection of water from Hunter Creek and Frying Pan River, tributaries of the Roaring Fork River;

"(*b*) Aspen Reservoir, with an active capacity of 28,000 acre-feet near the town of Aspen on the western slope to provide replacement water and water for future use in meeting the demands in western Colorado;

"(*c*) The Frying Pan-Arkansas tunnel, about 6 miles in length, for diverting water collected on the western slope to the eastern slope;

"(*d*) The Sugar Loaf Reservoir on the eastern slope of the Upper Arkansas Basin, enlarged from its present capacity by 17,000 acre-feet to 117,000 acre-feet for storage and regulation of water imported from the western slope;

"(*e*) The Snowden Diversion Dam on the Arkansas River above Snowden, Colo., and the Snowden Diversion Canal which would convey water from the Arkansas River to the enlarged Twin Lakes Reservoir;

"(*f*) The Twin Lakes Reservoir in the Upper Arkansas Basin, a few miles south of Snowden, Colo., enlarged from its present active capacity of 56,000 acre-feet to 260,000 acre-feet, for storage and regulation of water imported from the western slope by the Frying Pan-Arkansas diversion, water imported by existing Twin Lakes diversion, and water diverted from the Arkansas River by the Snowden Canal;

"(*g*) The Pueblo Reservoir on the Arkansas River west of Pueblo, Colo., with a capacity of 400,000 acre-feet to store water for irrigation and municipal use and for flood control;

"(*h*) A project power system comprising 60 miles of canals, 7 powerplants having an installed capacity of 104,800 kilowatts, 7 switchyards, 9 substations, and about 400 miles of transmission lines;

"(*i*) Specific municipal water supply facilities for furnishing additional municipal water to Colorado Springs, Pueblo, and several Arkansas Valley towns, which supply facilities would be constructed by the United States only after construction by the communities themselves proves infeasible."

The total capital cost of the project is given in the report under review as $147 440,000 on the basis of October 1949 prices.

The capital cost of the Roaring Fork diversion features alone, taken from exhibit 7 of the substantiating report, are as follows:

| | |
|---|---|
| Replacement Reservoir, Aspen, 28,000 acre-feet | $6, 746, 000 |
| Hunter Creek, Aspen Canal, 200 second-feet | 190, 000 |
| Hunter Creek Extension Canal | 280, 000 |
| Fryingpan collection system | 20, 427, 000 |
| Fryingpan-Arkansas divide tunnel | 8, 839, 000 |
| Total | 36, 482, 000 |

The annual water supply diverted is given in the report under review as 69,200 acre-feet.

The annual cost of operation and maintenance including reserves for replacement, and the net annual revenues are given in the report as $1,335,200 and $2,872,300, respectively. The nonreimbursable costs are allocated in the report at $17,956,000 and the reimbursable costs at $129,484,000. Of the latter figure, $59,930,000 is allocated to irrigation but the probable repayment by irrigation is reduced to $10,881,600 through the application of interest ($49,048,400) on the power and municipal water investments. The latter figure $49,048,400 represents about 38 percent of the total reimbursable cost.

In the report, the capital cost allocated to power is $40,032,000, comprising a direct cost of $34,021,000 and a joint cost of $6,011,000. The average annual energy output and revenue anticipated from the project are estimated in the report at 370 million kilowatt-hours at 5.5 mills, amounting to $2,035,000 and 97,125,000 kilowatt-hours at 3.5 mills, amounting to $340,000, or a total of

$2,375,000. The annual cost estimated on the bases of interest at 3 percent, repayment in 50 years on a 3 percent sinking fund basis, and operation and maintenance and replacement, as shown in the report under review at $854,000, is $2,410,000, which is slightly larger than the estimated annual revenue.

The proposed report of the Secretary of the Interior finds the initial development of the Gunnison-Arkansas project has engineering feasibility, is economically justified and financially feasible, and concurs in and adopts the recommendations of the regional director.

COMMENTS

The proposed report of the Secretary of the Interior, including the report of the regional director and the substantiating report thereof, has been reviewed and carefully considered within the time limitations permitted by the Flood Control Act of 1944 (Public Law 534, 78th Cong., 2d sess.).

As result of this review and study, the following comments are respectfully submitted:

1. It is the policy of the State of California to favor full development of the waters of the Colorado River System which have been apportioned to the upper basin under the Colorado River compact and beneficial utilization thereof in accord with the provisions of that compact and related documents and laws.

2. The primary interest of the State of California in the initial development (Roaring Fork diversion) of the potential Gunnison-Arkansas project is that in its construction and operation, California will receive its due apportionment of the waters of the Colorado River System as provided for in the Colorado River compact and related documents and laws.

3. The State of California favors congressional authorization of the initial development (Roaring Fork diversion) of the Gunnison-Arkansas project and the construction with Federal funds consistent with the national welfare (a) if the project qualifies under criteria, policies and procedures established by the Congress, and (b) if the diversion and utilization of the waters of the Colorado River System by and through the project works will not impair the rights of the State of California or any of its agencies to the waters of that system as defined and set forth in the Colorado River compact and related documents and laws, or will not adversely affect the quality of such waters to which California has rights.

4. If the project is authorized by the Congress, the State of California concurs in the recommendation of the regional director that suitable language be included in the authorizing document clearly stating that authorization or appropriation of funds for the project or for the continued investigations shall not in any way constitute a commitment, real or implied, to further importations from the Colorado River System to the Mississippi River Basin.

Appended for your consideration are the comments of the Colorado River Board of California.

Submitted by,

A. D. EDMONSTON,
*State Engineer.*

INTERDEPARTMENTAL COMMUNICATION

STATE OF CALIFORNIA,
*Los Angeles, August 2, 1951.*

To: Mr. A. D. Edmonston, State Engineer, Division of Water Resources, Public Works Building, Post Office Box 1079, Sacramento 5, Calif.
From: Colorado River Board of California, 315 South Broadway.
Subject: Review of Federal Report; Gunnison-Arkansas Project, Roaring Fork Diversion.

Reference is made to letter dated May 8, 1951, from the Commissioner of Reclamation to Hon. Charles H. Purcell, director of public works, State of California, transmitting in accordance with the requirements of the Flood Control Act of 1944, copies of the proposed report of the Department of the Interior on the initial development (Roaring Fork diversion), Gunnison-Arkansas project, Colo., Project Planning Report No. 7-8a.49-1, for information and such comments as the State might wish to make.

By interdepartmental communication dated May 17, 1951, you transmitted copies of that report to this office with the request that comments be furnished for incorporation in a report to be submitted by the director of public works. In response thereto, the Colorado River Board of California presents the following comments, which were approved at its regular meeting on August 1, 1951, with the request that they be incorporated in or transmitted with the report of the director of public works.

COMMENTS OF COLORADO RIVER BOARD OF CALIFORNIA

1. The report under review contemplates diversions from tributaries of Roaring Fork Branch of the Colorado River through a transmountain tunnel to the Arkansas River Basin. It proposes an average consumptive use of 90,100 acre-feet a year. This quantity is apparently within the entitlement of the State of Colorado under the upper basin compact, and would be unlikely to have an important physical effect on the water supply of the lower basin. It is indicated, however, by the title of the report, and otherwise, that the Roaring Fork diversion is only an initial stage of the potential Gunnison-Arkansas project which would involve exportation of a relatively large quantity of Colorado River water, possibly as much as 900,000 acre-feet a year, or more (H. Doc. 419, 80th Cong. 1st sess.) and appropriation of funds for continued investigation of such extended project is recommended by the regional director. Exportation of large quantities of pure snow water from the headwaters of the Colorado River would likely have serious adverse effect upon the quality of Colorado River water available to the lower basin under the Colorado River compact. The compact intends that the lower basin receive water which is usable. It is believed that before the project is authorized, adequate studies should be made to determine the effect of all anticipated transmountain diversions from the Colorado River upon the quality of water thereafter available to the lower basin.

Should the project be authorized by the Congress, the legislation should, as recommended by the regional director, include suitable language stating that the authorization constitutes no commitment, real or implied, to further exportation of water from the Colorado River System.

2. The Colorado River compact limits use of Colorado River water to the seven Colorado River Basin States. With exportation of any large quantity of Colorado River water to the Arkansas River, substantial return flows to the Arkansas may be experienced. Any authorization of the project should require adequate assurances from the State of Colorado that the water exported to the Arkansas will be consumptively used in Colorado, i. e., that it will not permit the flow of the Arkansas River at the Colorado-Kansas State line to be augmented by return flows from the Colorado River water.

3. The report assumes or implies the correctness of certain interpretations of the Colorado River compact with which California does not agree. If Congress approves the construction of the project, it should make it clear that it does not approve nor disapprove any such interpretations of the Colorado River compact.

4. The financial plan of the project depends upon the use of the interest component of power and municipal revenues to pay a major portion of the irrigation construction costs. Such use of the interest component is based upon an opinion of the Solicitor of the Department of the Interior in 1944, which has not been approved by the Congress and is believed to be contrary to law. It is also in conflict with the Report of the President's Water Resources Policy Commission submitted to the President in December 1950. The report of the Commission is likely to receive consideration during the current Congress.

As respects the use of the interest component, term of repayment, and other matters of general policy, Congress should first reach its conclusions upon the report of the President's Commission, and then apply them in the authorization of such a project as the one under review. For a statement of California's position on this subject, reference is made to the "Views of the State of California on Elements of a National Water Resources Policy Submitted to the President's Water Resources Policy Commission," dated June 1950.

COLORADO RIVER BOARD OF CALIFORNIA,
By RAYMOND MATTHEW, *Chief Engineer.*

OFFICIAL COMMENTS AND RECOMMENDATIONS OF THE STATE OF COLORADO ON THE INITIAL DEVELOPMENT, GUNNISON-ARKANSAS PROJECT, ROARING FORK DIVERSION, COLORADO

(Project planning report No. 7–8a.49–1, Bureau of Reclamation, Department of the Interior, dated January 1950)

AUGUST 7, 1951.

The SECRETARY OF THE INTERIOR.

SIR: On behalf of the State of Colorado and pursuant to section 1 of the act of December 17, 1944 (58 Stat. 887), there are herewith transmitted the comments, views, and recommendations of the State of Colorado concerning the initial development of the Gunnison-Arkansas project, Roaring Fork diversion, being

project planning report No. 7–8a.49–1, Bureau of Reclamation, Department of the Interior, dated January 1950.

These comments, views, and recommendations are submitted under the authority of chapter 265, Session Laws of Colorado, 1937, creating the Colorado Water Conservation Board, and defining its functions in accordance with the designation of such Board by the Governor of the State of Colorado pursuant to section 1 of the act of December 17, 1944 (58 Stat. 887) as the official State agency to act in such matters.

The comments, views, and recommendations of Colorado submitted herewith are as follows:

1. Colorado recognizes that the waters of the Arkansas River in the Colorado portion of the upper Arkansas River Basin are overappropriated and that serious loss in crop production on presently irrigated farmland results. Stabilized agricultural economy in the area requires supplemental water supplies. Additional quantity and better quality of domestic and municipal water are critically needed in the Arkansas Valley, Colo., for the cities of Colorado Springs, Pueblo, and various valley towns. New sources must be found if necessary and dependable water supplies for a growing population are to be provided. The best economy and the most efficient use of limited sources of water require multiple-use project development which will serve the needs of agriculture, requirements for domestic and municipal water supplies, flood control, the preservation of recreational and fish and wildlife values and the production of hydroelectric power. Neither further retirement of presently irrigated land to meet necessary and pressing municipal requirements for water nor project development designed to serve a single purpose would be consonant with the most desirable economic advancement of Colorado, or with the highest utilization of its limited water supplies.

2. Colorado concurs in the findings of the project report that the project described therein is engineeringly feasible, economically justified, and financially feasible, and that the proposed plan for the payment of reimbursable capital costs is in accordance with the Federal reclamation law.

3. The allocation of capital costs as between the various project features, including a nonreimbursable allocation to flood control and fish and wildlife preservation, is considered reasonable.

4. It is recognized that the allocation to the various project purposes of annual operation, maintenance and replacement costs has been made to correspond to the allocation of capital costs. Colorado recommends that an authorization of the project shall not preclude a readjustment of operation, maintenance and replacement charges as between municipal and domestic users and power and irrigation users which might more accurately reflect the actual use of water by said users.

5. It is also recommended that the authorization of the project include the valley pipeline as referred to in said report for the use and benefit of the various valley towns.

6. Colorado calls attention to the fact that the project, its operation, maintenance and the use of Colorado River water thereunder, must be subject to the provisions of the Colorado River compact of November 24, 1922 (H. Doc. 605, 67th Cong., 4th sess.), the upper Colorado River Basin compact of October 11, 1948 (Public Law 37, 81st Cong., 1st sess.), and the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057–1064). Further reference to this matter appears in these comments in connection with the subject of operating principles. The features of the project and their operation for the storage and reregulation of the native waters of the Arkansas River are subject to the provisions of the Arkansas River compact of December 14, 1948 (Public Law 82, 81st Cong., 1st sess.) between Colorado and Kansas. On July 24, 1951, the Arkansas River Compact Administration, an agency created by the compact for its administration, after a review of the project report and consideration of the effect of the operation of the proposed project on the administration of the provisions of the compact, adopted the following resolution:

"Whereas there has been submitted to the States of Colorado and Kansas by the Secretary of the Interior, in accordance with provisions of section 1 of the 1944 Flood Control Act, a report of the Bureau of Reclamation on the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado (Project Planning Report No. 7–8a.49–1) and such States are required to transmit to the Secretary of the Interior their respective official comments and recommendations on the report and proposed development; and

"Whereas the Arkansas River Compact Administration, an official interstate body created by the Arkansas River compact and charged with the administra-

tion of such compact, is interested in the proposed development to the extent that its construction and operation shall not interfere with the rights, interests, and obligations of Colorado and Kansas under the compact: Now be it

"*Resolved by the Arkansas River Compact Administration*, That the following comments and recommendations relating to said report of the Secretary of Interior, to wit:

" 'The Arkansas River Compact Administration submits these comments and recommendations to the Governors of Colorado and Kansas respecting the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, namely:

" '1. The Administration understands that the project plan proposes:

" '(*a*) The importation by appropriate project works of approximately 70,000 acre-feet of water a year from the Colorado River Basin to the Arkansas River Basin for supplemental irrigation and domestic water supplies in Colorado and for the production of hydroelectric energy.

" '(*b*) In connection with such importation of water and its regulation in the Arkansas River Valley by project works, the reregulation of native waters of the Arkansas River (the term "native water," as herein used, being those waters covered and defined by art. III-B of the Arkansas River compact).

" '2. The interstate water relations of Colorado and Kansas with respect to the Arkansas River do not justify any objection to the proposed project development for the importation of Colorado River water (described in subpar. (*a*) above).

" '3. The reregulation of native waters of the Arkansas River (native waters being as above mentioned) concerns the Arkansas River Compact Administration and both Colorado and Kansas in complying with the provisions of the Arkansas River compact and maintaining the benefits and obligations of the two States under that compact. To that end, it is recommended to the Governors of Colorado and Kansas, and expressed as a policy of the Arkansas River Compact Administration, that the initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, as set forth in Project Planning Report No. 7-8a.49-1 of the Bureau of Reclamation, be approved: *Provided, however*, That there shall be no reregulation of native waters of the Arkansas River as proposed in such report until a plan of operation, rules, regulations, procedures and agreements in furtherance thereof, including any pertinent agreements between the Corps of Engineers and the Bureau of Reclamation, shall have been submitted to, and approved by, the Arkansas River Compact Administration and the affected water users.

" '4. It is the purpose and intent of these recommendations that the proposed project development shall not interfere with or defeat the rights, interests, and obligations of Colorado and Kansas under the Arkansas River compact.'

be transmitted to the Governors of the States of Colorado and Kansas and such Governors be and are hereby requested to submit the same to the Secretary of Interior with their official State comments and recommendations upon said proposed project and development."

Colorado interprets and understands that paragraph 3 of the resolution of the Arkansas River Compact Administration is controlled by paragraph 4 thereof; and that the words "affected water users" in said paragraph 3 mean only water users in the State of Colorado so long as Colorado complies with the terms of said compact.

7. Paragraph 74, pages 27 to 33, both inclusive, under the heading "Operating principles," contains the operating principles which the report explains were recommended by a policy and review committee set up by the Colorado Water Conservation Board to study and review plans and reports on the first stage of the Gunnison-Arkansas project. This committee was composed of representatives of the Board, the Colorado Game and Fish Commission, western Colorado, the Arkansas Valley, and the city of Colorado Springs. The report fails to explain that such committee was required to report to the Colorado Water Conservation Board and its recommendations would not be effective until approved by that Board. The report on the project does not disclose what action was taken by the Board nor does it contain all of the recommendations of the policy and review committee. Some of the matters contained in the report of the committee are not strictly concerned with project operation, but are related to, and constitute a material part of, such operating principles.

The recommendations of the policy and review committee were revised and approved by the Colorado Water Conservation Board on February 22, 1951. (See letter with attachments of the Director of the Colorado Water Conservation Board dated February 27, 1951, and addressed to the Director of region 7, Bureau of Reclamation.) Paragraph 74, pages 27 to 33, both inclusive, of the report correctly sets forth that part of the report of the policy and review committee, designated "Article II—Operating principles," as revised and approved by the Colorado Water Conservation Board, but it omits other material portions of the committee's report as revised and approved by the board, namely:

"The action of the policy and review committee will be presented to the Colorado Water Conservation Board for such action as the Board deems proper.

"The action of the Colorado Water Conservation Board will be incorporated in the official comments of the State of Colorado, made pursuant to section 1 of the 1944 Flood Control Act.

"The authorization of the project will recognize the operating principles approved by the Colorado Water Conservation Board.

"Prior to commencement of project construction, the following conditions precedent must be satisfied.

"(*a*) There will be executed a payment contract between the Eastern Colorado Conservancy District and the United States in which will be incorporated the approved operating principles.

"(*b*) There will be executed such contract with the Twin Lakes Reservoir & Canal Co. as is necessary to make effective the approved operating principles.

"(*c*) The Eastern Colorado Conservancy District will firmly bind itself to the operation of the project in accordance with the approved operating principles.

"It is recommended that this project shall hereafter be referred to as the Fryingpan-Arkansas project. Approval of this provision by eastern Colorado representatives shall not be implied as an abandonment of their expressed intention to obtain approval of a project from the Gunnison River nor shall approval of this provision by western Colorado representatives be construed as any consent on their part to the authorization of a project for the exportation of water from the Gunnison River to eastern Colorado.

"The committee recognizes that the approval of this report is not to serve as a precedent or example for the approval of any other transmountain diversion of major proportions not heretofore authorized.

"The policy of the State of Colorado as initiated in statewide meetings held under the auspices of the State planning commission at Denver and Grand Junction, and as evidenced by resolutions dated June 15, 1935, and February 28, 1936, was not adhered to because surveys of the character mentioned in said resolutions were not available to the committee. Nothing herein contained shall be deemed or construed as a precedent for Federal projects not heretofore authorized until adequate surveys have been made and the necessary data are available so that a general allocation or apportionment of the waters of the Colorado River, allocated for consumptive use in the State of Colorado, under the upper Colorado River Basin compact, may be made between eastern Colorado and western Colorado, as distinguished from an attempt to execute such State policy by a piecemeal or series of partial allocations, any of which may seriously interfere with a complete, overall State program."

Paragraph 88 of the report under the heading "Recommendations," states:

"E. The project be operated under the direction of the Secretary of the Interior in accordance with the operating principles set forth in this report or as principles may be modified in the future by agreement between the Secretary and the commission established by the State of Colorado."

It is understood that the operating principles, mentioned in this quotation from the report, are those set forth in paragraph 74, pages 27 to 33, both inclusive, and that the "Commission" mentioned therein is the commission which may be created in the manner and for the purpose set forth in paragraph 17 of the operating principles. (See p. 33 of the report.)

Colorado's approval of the plans set out in the report and of the authorization of the project is conditioned upon compliance with the operating principles set forth in the report (see par. 74, pp. 27 to 33, both inclusive) and also full recognition and compliance with those portions of the policy and review committee's report, as revised and approved by the Colorado Water Conservation Board, which are omitted from the report and which are hereinabove set out; except that as to the name of the project, it is recommended and urged that in an appropriate manner the project should hereafter be known and referred to as the "Fryingpan-Arkansas project." It is noted from the letter of the Commissioner of Reclamation to the Secretary of the Interior, contained in the report, that it is stated:

"This development is designed as a self-contained unit, and its construction would not imply a commitment for developing future water supplies in the Gunnison River Basin for diversion to the Arkansas River Basin."

Colorado approves this statement but such a statement lends weight to the reason for changing the name of the project as herein recommended. Diversion from the Fryingpan River to the Arkansas has no relation to the Gunnison River. It is not proposed under this "self-contained" project to divert water to the Arkansas Basin from the Gunnison River. The identification of the project on the cover of the report and used throughout the report—Initial Development, Gunnison-Arkansas Project, Roaring Fork Diversion, Colorado—is a misnomer and misleading, and in the future may, in some manner, lead to unwarranted implications. In addition to the recommended change in project identification, Colorado requests that the project be authorized as the "Fryingpan-Arkansas project."

8. The Colorado River Water Conservation District is an agency created by State statute (ch. 20, p. 997, Session Laws of Colorado, 1937), for the conservation, use, and development of the water resources of the Colorado River and its principal tributaries. The area comprised within the district includes seven counties and a part of an eighth county within the natural drainage of the Colorado River in western Colorado. The Southwestern Water Conservation District is an agency created by State statute (ch. 231, p. 866, Session Laws of Colorado, 1941) for the conservation, use, and development of the water resources of the San Juan and Dolores Rivers and their principal tributaries. The district comprises seven counties and a part of an eight county within the natural basin of the Colorado River in western Colorado. When the board of directors of each of these two districts passed upon the report and recommendations of the Policy and Review Committee, including the "operating principles," as revised, their separate resolutions, among other things, contained the following language:

COLORADO RIVER WATER CONSERVATION DISTRICT BOARD

"*Be it further resolved*, That in the opinion of the board of directors of the Colorado River Water Conservation District, the Colorado Water Conservation Board should adopt a resolution that no further federally financed transmountain diversions from the natural Colorado River Basin should be approved for authorization until the surveys described in said section IV above are completed and the need for the use of water in western Colorado has been determined" (sec. IV, to which reference is made, is shown by the two paragraphs contained in the report of the Policy and Review Committee, quoted on p. 5 of these comments, and commencing with the words "The committee recognizes" and "The policy of the State," respectively).

SOUTHWESTERN WATER CONSERVATION DISTRICT BOARD

"* * * this board feels it should interpose no objection to the proposed diversion, but with the clear and distinct understanding this consent shall not be considered as waiver of objections to any other federally financed transmountain diversion of the waters of the Colorado River; and with the further understanding that the State Water Conservation Board of the State of Colorado shall not approve of any other such federally financed diversion project until the studies of the needs of the Western Slope be fully completed so that an intelligent decision relative to such needs may be given. We feel that after the many and long delays in making such studies and the promises made by some high in authority in the Reclamation Service, the Western Slope is entitled to have such studies completed in the very near future, and that no further federally financed transmountain diversions should be made without the completion of such investigations."

At the meeting of the Colorado Water Conservation Board on February 22, 1951, when the revised report of the policy and review committee, including revised "operating principles" for this project, was approved by the Colorado Water Conservation Board, the board unanimously approved two motions which provided that the resolutions, above-mentioned and partially quoted, submitted by the Colorado River Water Conservation District and the Southwestern Water Conservation District be accepted and approved as a policy of the Colorado Water Conservation Board.

9. Paragraph 68 commencing on page 23 in about the middle thereof states: "The proposed basic rate of $3.60 per acre-foot at the Pueblo Reservoir has been

determined to be within the payment capacity of the water users." It is respectfully requested that such proposed charge should not constitute either a maximum or a minimum charge nor should it indicate a uniform charge or indicate where water will be used or whether or not consideration in fixing charges can be given to return flows from such use. The figure is purely an estimated average charge per acre-foot and the district in allocating such water should be allowed complete latitude in connection therewith.

10. Paragraph 68 as contained on page 24 has the following sentence: "The district would assume responsibility for delivery of irrigation water." This responsibility is certainly not that of the United States, but neither should the district be responsible for patrolling every ditch. If water is turned out from the reservoir, it is immediately subject to the control of the State water officials, who should be advised of such rights in water and who are charged with the responsibility of delivering the same to the correct ditch. It is contemplated that each ditch will do its own policing.

11. Attention is directed to paragraph 68 on page 24 and the sentence reading: "This district or possibly another entity would contract with the Government for Federal construction of the specific municipal water system * * *" It is contemplated that a proper repayment entity under Colorado laws such as a metropolitan water district may be created for this particular purpose or that a joint contract executed between the various municipalities utilizing this feature will be executed and the project's authorization should be sufficiently broad to authorize any such contract deemed desirable.

12. Page 24 in the tabulation on function and source of revenue contains the following:

District tax ($132 million at 1 mill minus 10 percent) ..... $119,000

Attention is directed to the fact that under Colorado law, 3 possible rates are in existence; one-half of 1 mill, being the rate prior to delivery of project water; 1 mill, being the rate after such project water becomes available, and prior to the time of any deficiency or default; and 1½ mills in the event of default or deficiency. Levies in any of these three categories may be less but cannot exceed these figures.

13. Attention is directed to page 24, the item captioned "Municipal and Industrial Water, Municipal Supplies (38,000 Acre-Feet) At Various Rates)." It is respectively pointed out that it may be some years before this amount of water is utilized and that the quantity indicated is but an estimate which may be exceeded ultimately. The authorization of the project should not preclude the possibility of charging municipalities lower rates during the period of time that such water is not actually required for the municipal needs. Pueblo might ultimately require 10,000 acre-feet and desire at the outset to commit herself for the immediate purchase of 5,000 acre-feet. Until such time as she actually requires 10,000 acre-feet of water, she should not be charged therewith at the proposed rates. The project authorization should permit charging lower rates until the water is used for municipal purposes.

14. Attention is directed to paragraph 70 on page 25. It is respectfully suggested that the report makes no reference to potential evaporation savings by moving shallow plains storage reservoirs upstream and storing the same quantities of water at higher altitudes.

15. Attention is directed to a statement in the middle of page 38, reading:

"Such contracts should include provisions for the right of renewal thereof once or more than once under stated terms and conditions mutually agreeable to the parties and subject to increase or decrease in rates corresponding to increase or decrease of cost of construction and of operation, maintenance or improvement or deterioration in the payment ability of the water users."

This sentence must be reconciled with the existing Colorado law which is set forth in chapter 266 of the Session Laws of Colorado 1937, being section 19 thereof, which requires the petition for allocation of water filed by the water user and addressed to the conservancy district to contain therein the charge to be imposed for each acre-foot of water. The statute requires the petition to contain the following: (1) Name of applicant, (2) quantity of water to be purchased or otherwise acquired, (3) descriptions of lands upon which the water will be used and attached, (4) price per acre-foot to be paid, (5) whether payments will be made in cash or annual installments, (6) agreement that the annual installments and the charges for maintenance and operating shall become a tax lien upon the lands for which such water is petitioned and allotted and to be bound by the provisions of this act and the rules and regulations of the board. While it was contemplated initially that the price per acre-foot would be fixed, such as, in the

case of the Colorado-Big Thompson project, $1.50 per acre-foot, it is believed that this statutory provision can be complied with by stating the price per acre-foot shall be not less than $——— nor more than $———.

Respectfully submitted.

SAN THORNTON,
*Governor, State of Colorado and Ex-Officio*
*Chairman of the Colorado Water Conservation Board.*
CLIFFORD H. STONE,
*Director, Colorado Water Conservation Board.*

STATE OF KANSAS,
OFFICE OF THE GOVERNOR,
*Topeka, August 2, 1951.*

Hon. OSCAR L. CHAPMAN,
*Secretary of the Interior,*
*Department of the Interior, Washington, D. C.*

DEAR MR. SECRETARY: Enclosed herewith is a resolution adopted by the Colorado-Kansas Arkansas River Compact Administration. As attorney general of Kansas, I served on the compact commission of these two States which drafted a workable compact now being successfully administered by the present compact administration composed of representatives of both States and Gen. Hans Kramer as a representative of the United States.

That administrative agency, by the enclosed resolution, presents it recommendations. As Governor of Kansas I have also received the recommendations of my special advisory committee, and they are in accord with the enclosed resolution, as are my personal convictions resulting from my own knowledge of and experience with the overall Arkansas River project.

Kansas has no objection to the development of the proposed Gunnison-Arkansas project as set forth in Project Planning Report No. 7–8A, 49–1 of the Bureau of Reclamation. However, we in Kansas would oppose any attempt for this development to interfere with the rights, interests, and obligations of Colorado or Kansas under their Arkansas River compact.

That is to say, we in Kansas would object only to any reregulation of native waters of the Arkansas River Basin until such time as it could be definitely determined that reregulation of native waters would not be detrimental to Kansas or to interstate water relations between Kansas and Colorado.

We assume, of course, that no such attempt at reregulation would be made or desired without a meeting of the two States and the United States after the completion of the project.

Sincerely,

EDWARD F. ARN, *Governor.*

RESOLUTION

Whereas there has been submitted to the States of Colorado and Kansas by the Secretary of the Interior, in accordance with the provisions of section 1 of the 1944 Flood Control Act, a report of the Bureau of Reclamation on the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado (Project Planning Rept. No. 7–8A, 49–1), and such States are required to transmit to the Secretary of the Interior their respective official comments and recommendations on the report and proposed development; and

Whereas the Arkansas River Compact Administration, an official interstate body created by the Arkansas River compact charged with the administration of such compact, is interested in the proposed development to the extent that its construction and operation shall not interfere with the rights, interests and obligations of Colorado and Kansas under the compact: Now be it

*Resolved by the Arkansas River Compact Administration*, That the following comments and recommendations relating to said report of the Secretary of Interior, to wit:

The Arkansas River Compact Administration submits these comments and recommendations to the Governors of Colorado and Kansas respecting the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, namely:

1. The Administration understands that the project plan proposes:

(a) The importation by appropriate project works of approximately 70,000 acre-feet of water a year from the Colorado River Basin to the Arkansas

River Basin for supplemental irrigation and domestic water supplies in Colorado and for the production of hydroelectric energy.

(b) In connection with such importation of water and its regulation in the Arkansas River Valley by project works, the regulation of native waters of the Arkansas River (the term "native waters," as herein used, being those waters covered and defined by art. III–B of the Arkansas River compact).

2. The interstate water relations of Colorado and Kansas with respect to the Arkansas River do not justify any objection to the proposed project development for the importation of Colorado River water (described in subparagraph (a) above).

3. The reregulation of native waters of the Arkansas River (native waters being as above mentioned) concerns the Arkansas River Compact Administration and both Colorado and Kansas in complying with the provisions of the Arkansas River compact and maintaining the benefits and obligations of the two States under that compact. To that end, it is recommended to the Governors of Colorado and Kansas, and expressed as a policy of the Arkansas River Compact Administration, that the initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, as set forth in Project Planning Report No. 7–8a, 49–1 of the Bureau of Reclamation, be approved; provided, however, that there shall be no reregulation of native waters of the Arkansas River as proposed in such report until a plan of operation, rules, regulations, procedures and agreements in furtherance thereof, including any pertinent agreements between the Corps of Engineers and the Bureau of Reclamation, shall have been submitted to, and approved by, the Arkansas River Compact Administration and the affected water users.

4. It is the purpose and intent of these recommendations that the proposed project development shall not interfere with or defeat the rights, interests and obligations of Colorado and Kansas under the Arkansas River compact.

be transmitted to the Governors of the States of Colorado and Kansas and such Governors be and are hereby requested to submit the same to the Secretary of Interior with their official State comments and recommendations upon said proposed project and development.

The foregoing is a true and correct copy of the resolution adopted by the Arkansas River Compact Administration at its meeting of July 24, 1951, at Lamar, Colo.

HARRY C. NEVIUS, *Secretary.*

THE STATE OF UTAH,
OFFICE OF STATE ENGINEER,
*Salt Lake City, June 5, 1951.*

Re Gunnison-Arkansas project, Project Planning Report No. 7–8a.49–1 January, 1950.

SECRETARY OF THE INTERIOR,
*Department of the Interior,*
*Bureau of Reclamation, Washington 25, D. C.*
(Attention: Michael Straus, Commissioner.)

DEAR SIR: This will acknowledge receipt of your letter dated May 8, 1951, and two copies of the Department of the Interior's proposed report on the initial development (Roaring Fork diversion), Gunnison-Arkansas project, identified as Project Planning Report No. 7–8a.49–1, January 1950.

Pursuant to your request for views and recommendations, will state that Utah makes no adverse recommendations or comments with respect to the approval, authorization or construction of this project.

Sincerely yours,

JOSEPH M. TRACY, *State Engineer.*

STATE OF WYOMING,
WYOMING NATURAL RESOURCE BOARD,
*Cheyenne, June 11, 1951.*

MR. MICHAEL W. STRAUS,
*Commissioner, Bureau of Reclamation,*
*Washington, D. C.*

DEAR MR. STRAUS: This will acknowledge receipt of your letter of May 8, 1951, and accompanying report of the Bureau of Reclamation on the Gunnison-Arkansas project, Roaring Ford diversion, Colorado.

Agreeable to your request I have reviewed the above-captioned report and offer comments thereon as follows:

1. The project appears to be feasible inasmuch as it is estimated to provide benefits of approximately 1¾ times the cost.

2. That the water proposed to be diverted from the Colorado River watershed is well within the allocation of Colorado under the terms of the upper Colorado River compact.

In view of the foregoing I can see no reason why Wyoming should oppose construction of the Gunnison-Arkansas project as proposed in the report of the Bureau of Reclamation dated January 1950.

Respectfully submitted.

J. ELMER BROCK,
*President, Wyoming Natural Resource Board.*
L. C. BISHOP,
*Director, Wyoming Natural Resource Board.*

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
*Washington, September 26, 1951.*

Hon. MICHAEL W. STRAUS,
*Commissioner of Reclamation, Bureau of Reclamation,*
*Department of the Interior, Washington, D. C.*

DEAR MR. STRAUS: Reference is made to your letters of May 8, 1951, to the Secretary of the Army and to the Chief of Engineers, enclosing copies of your report dated January 1950 on the initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, for the information and comments of the Department of the Army, in accordance with section 1 of the Flood Control Act of 1944. I have been directed by the Secretary of the Army to furnish you the views of the Department of the Army on your report. You state in your letter to the Secretary of the Army that your report will be sent to the President and to the Congress under provisions of section 9 (a) of the Reclamation Project Act of 1939.

Your report recommends approval of a multiple-purpose, initial-development plan, based on transmountain diversion of water from the Colorado River Basin eastward to the Arkansas River Basin for irrigation, hydroelectric power, municipal water supply, flood and sediment control, stream-pollution abatement, and fish and wildlife conservation. The plan, estimated for a 10-year construction period and a total cost of $147,440,000 based on 1949 prices, comprises about 50 miles of canals and tunnels and a water-replacement reservoir on the western slope of the Continental Divide; 6 miles of transmountain diversion tunnel; and on the eastern slope 3 earthfill dams, 60 miles of power canal, 10 miles of diversion tunnel, 7 hydroelectric powerplants with a total installed capacity of 104,800 kilowatts, 400 miles of transmission line, and a municipal water-supply system. Water imported to the Arkansas River Basin from the Colorado River Basin is to come out of Colorado's apportionment under the upper Colorado River compact of October 11, 1948.

Of the $147,400,000 total estimated cost (based on 1949 prices) of the recommended plan, $59,930,000 is allocated to irrigation, $40,032,000 to power, $29,522,000 to municipal water supply, $15,777,000 to flood control, and $2,179,000 to fish and wildlife conservation. The annual charges over a 100-year period with interest at 2.5 percent are estimated at $5,568,000. Your report estimates the annual benefits at $9,789,000 consisting of $3,339,000 from irrigation, $4,064,000 from power, $1,662,000 from municipal water supply, $583,000 from flood control, and $141,000 from sediment control. The benefit-cost ratio is estimated at 1.76 to 1. It is further estimated that the costs allocated to irrigation, power, and municipal water supply ($129,484,000) probably can be returned to the United States as follows: Irrigation, 40 years without interest by payment of $10,881,600 by the irrigators and application of $49,084,000 (82 percent) interest on power and municipal water investments; power, 50 years with interest at 3 percent, $40,032,000; and municipal water supply, 40 years with interest at 2 percent, $29,522,000. The use of an interest component on power investments and also on investments for municipal water supply to repay irrigation costs is a matter which should receive the most careful consideration by Congress. In this connection, your attention is invited to the letter of February 1, 1950, from the Director of the Bureau of the Budget to the Secretary of the Interior, commenting on your Columbia River Basin report (printed in H. Doc. No. 473, 81st Cong., 2d sess.), in which it is stated "* * * in setting rates for the sale of power, the

Secretary may consider the application of interest on the power investment, from the various projects covered by the account, to the return of nonpower costs, only to the extent that he can do so under reclamation law—existing or as hereafter amended. As you know, this is one of the matters on which recommendations are expected from the President's Water Resources Policy Commission."

Your report states that the designs and estimates are based on preliminary information and cites the necessity for additional studies and detailed surveys for preparation of the definitive plan. Owing to the effect of Pueblo Dam on the downstream Corps of Engineers' John Martin Dam and Reservoir, it is requested that this office be afforded the privilege of further review of certain features of the project upon completion of definite plans.

You state in your report that the initial development (Roaring Fork diversion) is designed as a self-contained unit, and that its construction would not imply a commitment for developing future water supplies in the Gunnison River Basin for diversion to the Arkansas River Basin.

It is noted with respect to the economic justification of the project that the sum of the direct irrigation benefits to farmers, direct power benefits, and benefits to municipal water, flood control, and sediment control (totaling $5,826,000) is sufficient to justify the annual project cost of $5,568,000. Since the project is justified on the basis of direct benefits, the question of the use of secondary benefits does not arise with respect to the matter of economic justification.

Although the report does not specifically state a policy for operation of the 93,000 acre-feet of storage capacity in Pueblo Reservoir that is allocated to flood-control purposes, it is assumed that the operation will be in accordance with regulations to be concurred in by the Secretary of the Army as specified under section 7 of the Flood Control Act of December 22, 1944, and that such regulations will be formulated to assure optimum flood-control benefits from the flood-control-storage allocation. With respect to the nonreimbursable flood-control allocation of $15,777,000 which was obtained by capitalizing the annual flood-control benefits of $583,000, it is noted that according to page 94 of the appendix containing the substantiating material, this amount is stated to be arrived at on the basis of Department of the Army policy which provides for capitalization of benefits at 3 percent interest for a 50-year period of analysis. This is not correct. Although this method has been used in some cases, particularly where the overall project justification is close to unity, its use in a project with a relatively high benefit-cost ratio means that flood control is bearing more than its proper share of the cost of the project. It is our belief that all project purposes should share in the savings due to multiple-purpose development.

It is considered essential that this study, and any future studies that propose importation of additional water into the drainage basin of the Arkansas River, be thoroughly coordinated with the authorized study of the Arkansas-White-Red River Basins. Region 7 of the Bureau of Reclamation is to be commended for its program of coordination of planning with other Federal and State agencies in the early phases of investigation for this report.

The proposed project does not appear to conflict functionally with any project or plans of the Corps of Engineers, but the privilege of further review of certain features of the project upon completion of definite plans is requested.

The opportunity to review your report on the initial development, Gunnison-Arkansas project, Roaring Fork diversion, is appreciated.

Sincerely yours,

LEWIS A. PICK,
*Lieutenant General, Chief of Engineers.*

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
*Washington, May 23, 1952.*

The honorable the SECRETARY OF THE INTERIOR.

DEAR MR. SECRETARY: In his letter of May 8, 1951, the Commissioner of Reclamation, acting in your behalf, requested comments upon a proposed report entitled "Initial Development, Gunnison-Arkansas Project."

It appears that the irrigation segment of the proposed multiple-purpose undertaking consists of two distinct phases. One of these is aimed at making more effective use of the water supply already available in the upper Arkansas Basin. The other is designed to increase this supply by importation of water from the Colorado River Basin. It is noted that the costs and benefits of these two phases are combined for purposes of economic evaluation. This is not in accord with the basic principles of evaluation set out in the May 1950 report of

the Subcommittee on Benefits and Costs of the Federal Interagency River Basin Committee. We believe that to bring your report into line with these principles it should present the benefits and costs of all separable increments of the proposed project, and should show that each such increment is more economical than any feasible alternative. It seems particularly important, in view of the obviously high cost of importing water from the Colorado River Basin, that a separate evaluation be made of the use of such water for irrigation.

We assume that provisions will be made for replacement of any national forest facilities that may be impaired by the proposed project.

The opportunity afforded us to review this report is appreciated.

Sincerely,

CHARLES F. BRANNAN, *Secretary.*

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
*Washington, October 10, 1951.*

The honorable the SECRETARY OF THE INTERIOR.

DEAR MR. SECRETARY: In his letter of May 8, 1951, the Commissioner of Reclamation, acting in your behalf, requested comments upon a proposed report entitled "Initial Development, Gunnison-Arkansas Project." This report was referred to all of the interested agencies of this Department and has been reviewed by experts in soils, agricultural economics, engineering, soil and water conservation, agronomics, and irrigation practices. The following comments are based upon this technical review.

It appears from our analysis that the irrigation segment of the proposed multiple-purpose undertaking actually consists of two distinct phases. One of these is aimed at making more effective use of the water supply already available in the upper Arkansas Basin. The other is designed to increase this supply by importation of water from the Colorado River Basin.

In our opinion the former is more important than the latter. According to the report, less than half of the water now passing the headgates of the irrigation works is actually applied to farm fields. Moreover, some of the floodwaters are lost and winter diversions are excessive. Clearly there is a need for a full-scale program designed to reduce water wastage, to improve irrigation systems and practices and to capture more Arkansas River floodwater. Parts of such a program are proposed in the report. But there is little indication of how some of the contemplated measures would be put into effect. It seems to us that this phase of the irrigation plan should be considerably expanded. This could easily be accomplished through the interagency planning effort now underway in the Arkansas-White-Red River Basins. This leads us to suggest that the proposed project be made an integral part of the comprehensive plan which will result from that effort, and that in the process the provisions for making more effective use of the available water be extended and strengthened. We are calling this to the attention of our representative of the interagency committee for the region and are asking him to cooperate to the fullest possible extent in all efforts to more fully meet the needs of the irrigation enterprises of the upper Arkansas River Basin.

It is also suggested that this phase of the irrigation plan be evaluated separately. It should, we believe, be considered the basic irrigation program for the area. The proposal to import water should be considered as an additional increment and evaluated as such.

All segments of the proposed multiple-purpose program are combined for purposes of economic evaluation. Hence it is not possible to determine, from the data given in the report, the possible effects of the separate evaluations suggested. We note, however, that the cost of the combined irrigation program would exceed $65,000 per farm (if the additional water made available is applied to 921 farms, as assumed in the calculation of benefits), or roughly $500 per irrigated acre. This high cost is, we assume, largely due to the importation feature of the combination. When such costly measures are required every possible alternative solution should be given thorough consideration.

All other separable segments of the multiple-purpose program should, of course, also be separately evaluated. We would suggest that in making these evaluations the Bureau of Reclamation utilize the procedures recommended by the Subcommittee on Benefits and Costs of the Federal Interagency River Basin Committee. As the principles proposed by the subcommittee have been adopted by this Department their use would make it possible for us to concur in your conclusions as to the economic feasibility of the various segments of the plan.

If it should be considered necessary to proceed with the project in advance of completion of the comprehensive plan for the Arkansas-White-Red region, we would suggest:

1. That the means by which it is intended to bring about more effective use of water now available be more fully explained and provided for, and that, at the very least, the contemplated conversion of winter flow be made a condition of Federal participation.

2. That definite provisions be made for the replacement of any national forest facilities or services that may be impaired by the project, and for protection of the Maroon-Snowmass primitive area against invasion. As it would be impossible to replace this primitive area, or to repair any damage that it might suffer the only way to preserve its unique public value is to make certain that it is not affected by the project.

3. That provisions be made for the protection of any potentialities that may exist for economically justified small-scale irrigation at higher altitudes on both sides of the Continental Divide; in particular for the irrigation of pastures and meadows where needed to insure a balanced grazing program.

We greatly appreciate the opportunity afforded us to review this report.

Sincerely,

CHARLES F. BRANNAN, *Secretary.*

DEPARTMENT OF COMMERCE,
BUREAU OF FOREIGN AND DOMESTIC COMMERCE,
OFFICE OF INDUSTRY AND COMMERCE,
*Washington 25, D. C., July 30, 1951.*

MR. MICHAEL E. STRAUS,
*Commissioner, Bureau of Reclamation,*
*Department of the Interior, Washington 25, D. C.*

DEAR MR. STRAUS: We have several comments on the proposed report of the Department of the Interior on the initial development (Roaring Fork diversion), Gunnison-Arkansas project.

Interest on return payments from power: We have a question concerning paragraph 69 of page 65 of the Report of the Regional Director, which reads: "Parts of the interest on return payments from power (3 percent) and municipal water (2 percent) would be applied to the irrigation investment."

Two important questions of policy are raised by this proposal. Ordinarily, return payments from power and municipal water would be returned to the national Treasury, from where they would be eligible for appropriation to any region and any purpose the Congress saw fit. The report's proposal would automatically appropriate these funds to this area and to the particular purpose of irrigation.

In our view such an important point of policy should be considered independently of a project.

Highway relocation: The information in the report as to highway inundation and relocation is brief and very little factual data are presented. While more study would be necessary before final estimates of cost of highway relocation could be given, it appears that the Bureau of Reclamation estimates for land and rights may be adequate for highway relocations in the vicinity of the Aspen Reservoir, the Sugar Loaf Reservoir enlargement, and the Pueblo Reservoir enlargement. The cost of highway relocations at these three projects is estimated to represent approximately 15 percent, 65 percent, and 50 percent, respectively, of the cost of land and rights.

However, in the case of the Twin Lakes Reservoir enlargement project, the cost of highway relocation would appear to be several times the Bureau's estimated cost of land and rights.

*Hydrologic data*

In 1948 the FIARBC subcommittee on hydrology recommended that additional evaporation, precipitation, and other meteorological stations be established in the vicinity of the project area. Perhaps it would be well for the Bureau of Reclamation to acknowledge the need for additional data of the above type in the present report.

*Control surveys*

In the substantiating report section of this study the planners make certain recommendations regarding needed surveys and maps. In this connection, the Coast and Geodetic Survey is now extending the basic (first and second order)

horizontal and vertical control in that area. This control is used by the Geological Survey and other mapping and engineering agencies as the basic framework for detailed topographic mapping and other engineering surveys.

Sincerely yours,

H. B. McCoy, *Director.*

FEDERAL POWER COMMISSION,
*Washington 25, August 22, 1951.*

Subject: Initial development, Roaring Fork diversion, Gunnison-Arkansas project, Colorado.

Mr. MICHAEL W. STRAUS,
*Commissioner, Bureau of Reclamation,*
*Department of the Interior, Washington 25, D. C.*

DEAR MR. STRAUS: The comments herein with respect to the proposed report of the Department of the Interior on the initial development, Roaring Fork diversion, of the Gunnison-Arkansas project, Colorado, are transmitted in response to your letter of May 8, 1951. The transmittal of these comments by the Commission is in accordance with the established procedures of the Federal Inter-Agency River Basin Committee.

The plan of development recommended in the proposed report provides for the importation of water from the Roaring Fork Basin of the Colorado River watershed into the upper Arkansas River Valley, and the regulation and use of both imported and native flows for supplemental irrigation, water supply, flood control, power development, and other purposes. The report states that, although the proposed plan is designed as a self-contained unit, it could constitute the initial stage of a much larger project involving the future diversion of water supplies from the Gunnison River in the Colorado Basin to the Arkansas River Basin.

As described in the report, the recommended development would consist of a system of canals and tunnels on the western slope to collect water for diversion, and the proposed Aspen Reservoir on the Roaring Fork River to provide replacement water; a tunnel under the Continental Divide to convey water to the Sugar Loaf Reservoir, which would be enlarged; a canal extending from the Sugar Loaf Reservoir to the Albert powerplant to be constructed at the head of the enlarged Twin Lakes Reservoir, and also a canal diverting water from the Arkansas River into the larger Twin Lakes Reservoir; a canal extending from the Twin Lakes Reservoir to Salida, Colo., to provide for the development of power at plants to be constructed at power drops at the Granite, Wapaco, Princeton, Johnson, and Salida sites; a reservoir and powerplant located on the Arkansas River immediately upstream from Pueblo, Colo.; a power transmission network; and facilities for furnishing additional municipal water supply for certain cities and towns in the Arkansas River Basin.

The report shows that by diverting 69,200 acre-feet of water annually from the Colorado River Basin and through regulation and conservation of native flows, the plan would provide a total of about 185,000 acre-feet of supplemental irrigation water per year for use on the 322,000 acres of irrigated land in the Arkansas Valley. This would reduce the average annual water shortage on these lands from the 35 percent now experienced to about 15 percent. The 7 power plants in the plan would have a total installed capacity of 104,800 kilowatts, of which 93,800 kilowatts would be considered dependable. The estimated average annual generation at the plants is shown as 505 million kilowatt-hours, including 400 million kilowatt-hours of primary energy. The plan would provide about 17,000 acre-feet of water annually for municipal supply to Colorado Springs, Pueblo, and several Arkansas Valley towns. It was estimated that operation of the reservoirs would eliminate two-thirds of the annual flood damages in the reach of river between the proposed Pueblo Reservoir and the existing John Martin Reservoir. Other benefits would include sediment control, pollution abatement, and fish and wildlife conservation.

The cost of the proposed development is estimated at $147,440,000 on the basis of October 1949 prices. Under the tentative cost allocation proposed, $59,930,000 would be charged to irrigation; $40,032,000 to power; $29,522,000 to municipal and industrial water supply; $15,777,000 to flood control; and $2,179,000 to fish and wildlife. The last two items named would be considered as nonreimbursable. Of the amount allocated to irrigation, $10,881,600 would be repaid by the irrigators, $35,478,000 would be returned through use of the interest component on power revenues, and $13,570,400 returned through use of the interest component of

municipal and industrial water-supply revenues. A payout period of 50 years is contemplated in the report.

In the benefit-cost analysis given in the report, the annual cost of the development is estimated at $5,568,000 on the basis of 2.5 percent interest rate and 100-year amortization period. The total average annual benefits are estimated to $9,789,000, indicating a benefit-cost ratio of 1.76 to 1. It is stated in the report that the direct benefits, estimated at $6,262,000 annually, would be sufficient to justify the annual project costs.

It is noted that the annual power benefits are estimated in the report at $4,064,000. This includes $2,375,000 estimated revenues from the sale of energy at 5.5 mills per kilowatt-hour of firm energy and 3.5 mills per kilowatt-hour of secondary energy; $327,000 in savings in production costs to utilities purchasing project power for resale (assumed to be passed on to the consumers); $1,199,000 as a proportionate share of the retailing utilities' benefits arising from resale of project power; and $163,000 as a proportionate share of the increased value of goods and services produced by final utilization of the power. The report considers the first item as the direct power benefit and the three remaining items as indirect benefits.

The Commission believes that the inclusion of at least some of the indirect benefits listed above in the project justification is questionable. On the basis that the power has a value equal to the cost of production by alternative steam-electric plants, the Commission staff estimates the annual power benefits of the development at approximately $3,400,000. The staff reports, however, that the project power benefits, both as estimated in the report and as computed by the staff, are substantially in excess of the annual power costs, assuming adoption of the proposed cost allocation and also using a 2.5 percent interest rate and a 50-year amortization period.

Using the power benefits as computed by the Commission staff and the direct benefits for other functions as given in the report, the staff finds that the total of these benefits would exceed the annual costs, computed on the basis of 2.5 percent interest rate and 50-year amortization period. It appears, therefore, that as stated in the report the overall development would be justified by the direct benefits.

As indicated above, 82 percent of the cost of the development chargeable to irrigation would be repaid through use of the interest component of the revenues from the sale of power and municipal water supplies. The Commission is familiar with the interpretations under which such procedures have been adopted by your Department. It believes, however, that the interest portion of power revenues represents a power cost that should be paid into the Federal Treasury rather than diverted for use as irrigation subsidy.

The Commission staff has made studies of the proposed development both during the time of project formulation and in review of the subject report of your Department. The staff reports that its estimates of the power available at the project are in substantial agreement with the estimates of your office. The staff also advises that its studies confirm the conclusion of the report that there would be a market for the project power by about 1960.

Consideration has been given by the staff to certain modifications of the plan, all of relatively minor nature, which may prove desirable from the standpoint of power development. The report also recognizes that further investigations may show the desirability of altering some of the project details. For example, it is stated in the report that further study may show that it is more economical to develop the Elbert power head in two steps, each utilizing about one-half of the 515 feet of available head. A second alternative plan for this project studied by the staff would provide a pond on Corske Creek to serve as an afterbay for an upper plant utilizing about 125 feet of head, and to act as a forebay for a power-plant at the Elbert site developing the remainder of the head. Such a plan would not only provide for greater flexibility of operation but also would permit a larger power installation at the Elbert plant for low-load-factor operation.

The staff points out that it would be desirable also to provide forebays for the Granite and Wapaco powerplants if topographic conditions are suitable for the construction of such facilities. It is noted that the plans include forebays for the three lower plants on the Arkansas power canals, namely, the Princeton, Johnson, and Salida plants. In view of the large storage capacity to be provided above and below the Granite plant, the staff believes that it would be desirable to increase the ultimate installation at that plant from the 19,200 kilowatts proposed to approximately 40,000 kilowatts for peaking purposes.

The staff studies indicate that it may be desirable to develop a small amount of power at the Aspen Dam for project operation and for possible use on a small local load. On the basis of the proposed operation of the reservoir, it appears that an installation of approximately 500 kilowatts might be warranted.

It is noted that the report considers that the power capacity at the Pueblo Dam would not be dependable because of the possible lack of sufficient head and flow for power development during winter peak-load months. The staff suggests that a part of the capacity might be made dependable by maintaining a dependable power head at maximum drawdown through tailrace excavation or otherwise, and by effecting agreements whereby winter releases could be stored in downstream reservoirs such as John Martin.

The proposed plans do not provide for the development for power of the 2,400 feet of fall in the 70-mile reach of the Arkansas River between Salida and the Pueblo Reservoir. Studies by the staff indicate that on the basis of the water available under the recommended plans, a dependable capacity of about 89,000 kilowatts and an average annual generation of approximately 470,000,000 kilowatt-hours could be developed in this section of the river. The staff advises that such development would not be economically feasible at the present time but that the proposed plans for initial development as outlined in your report would not interfere with the future development of this power.

The Commission appreciates the opportunity of reviewing and commenting upon the report of your Department.

Sincerely yours,

MON C. WALLGREN, *Chairman.*

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FEDERAL SECURITY AGENCY,
PUBLIC HEALTH SERVICE,
*Washington 25, D. C., August 16, 1951.*

The Honorable OSCAR L. CHAPMAN,
*The Secretary of the Interior,*
*Washington 25, D. C.*

DEAR MR. SECRETARY: Pursuant to the policies and procedures established by the Federal Inter-Agency River Basin Committee, we have reviewed the preliminary report furnished by your Department entitled "Initial Development (Roaring Fork Diversion) Gunnison-Arkansas project, Colorado," dated January 1950.

Our comments, for the most part, consist of suggested revisions of statements concerning water pollution in the Arkansas River Valley. These revisions are based on more up to date data compiled in recent joint studies by the Public Health Service and the State of Colorado.

The following comments are made with page identification as carried in your report:

A. Report of the regional director:

(1) Page 12, paragraph 36:

Suggest this paragraph be replaced in its entirety by the following:

"36. Stream pollution in the mountainous and primitive western slope diversion area presents no problem at the present time. However, stream pollution is of real significance in the eastern slope area. Diversion water from the western slope will alleviate this pollution somewhat, but the construction of adequate sewage and waste treatment plants will be necessary to make the poilution abatement complete."

B. Substantiating report:

(1) Pages 87 and 88, chapter XII:

Suggest this chapter be replaced in its entirety by the following:

"PRESENT CONDITIONS AND STREAM POLLUTION PROBLEMS

"No stream pollution problems exist on the western slope diversion area, where transmountain water is to be obtained. However, the eastern area, which extends from the headwaters of the Arkansas River, near Leadville, to the Colorado-Kansas boundary, has a very definite stream pollution problem.

"Almost at its inception, the Arkansas River is defiled by the uncontrolled discharge of municipal and industrial wastes at Leadville. Progressive deterioration of the river waters then continues to the Kansas line; serious pollution problems exist in a number of local areas.

"The sanitary requirements of water used for irrigation purposes have not been established; however, from available data, the need for pollution abatement of waters to be used for irrigation is apparent below Leadville, Pueblo, Rocky Ford, and other areas.

"Stream pollution is always a potential hazard to public water supplies. That this hazard exists for users of the Arkansas River water is exemplified by the problem of public water supply treatment at Pueblo. Its supply has only provisional approval as an interstate carrier watering point.

"BENEFITS

"The initial development would import transmountain water derived from melting snow on a heavily forested and practically uninhabited watershed. The water would be of excellent quality from a chemical and bacteriological standpoint. Its effect on the Arkansas River should prove beneficial from the standpoint of both quality and quantity, particularly during periods of low flow. Dilution of the highly mineralized river water and the stabilization of flow will be a boon to many users, especially municipal and industrial water supplies.

"The beneficial effects of the diversion water on pollution in the Arkansas River, however great, should not be considered a panacea for its entire water-pollution problem. Water-pollution abatement can only be accomplished by the concurrent installation of adequate sewage and waste-treatment facilities at all significant sources of pollution."

(2) Page 105, section titled "Public Health Service":

Suggest the last three lines of this paragraph which read "* * * in order that those situations attributable to present practices and natural causes may not be eventually cataloged as the end products of reclamation development." be changed to read: "* * * and will furnish criteria by which the benefits of the diversion project may be measured in the future."

Sincerely yours,

M. D. HOLLIS,
*Chief Sanitary Engineering Officer, PHS,*
*FSA Member, Federal Interagency River Basin Committee.*

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EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
*Washington 25, D. C., March 27, 1953.*

Hon. HUGH BUTLER,
*Chairman, Committee on Interior and Insular Affairs,*
*United States Senate, Washington 25, D. C.*

MY DEAR MR. CHAIRMAN: This will acknowledge receipt of your request of February 17, 1953, for the views of the Bureau of the Budget on S. 964, to authorize the construction, operation, and maintenance by the Secretary of the Interior of the Fryingpan-Arkansas project, Colorado.

The Secretary of the Interior has been requested to review the Fryingpan-Arkansas project report, as well as all other reclamation project reports pending in this office, to determine whether they conform to his program, in terms of present policies, and whether any modification or revision should be made.

You may be assured that our action will be completed at the earliest practicable date after receipt of the Secretary's views on this project consistent with a careful analysis, in the light of the President's budgetary policies, of the engineering and economic aspects of the recommended construction and pertinent comments of the States and Federal agencies concerned.

For the reasons set forth above, this office is not prepared, at this time, to make a recommendation on S. 964.

Sincerely yours,

JOS. M. DODGE, *Director.*

Senator MILLIKIN. We have a telegram from Hon. Dan Thornton, Governor of Colorado, as follows:

Re S. 964, to authorize Fryingpan-Arkansas project. The Colorado Water Conservation Board and I, as Governor, have approved and still approve this project and urge its early authorization. The increase in construction costs since the formal Colorado comments were submitted in 1951 does not in my opinion materially affect the economic feasibility of the project. The action of the Colo-

rado General Assembly appropriating funds for a study of the western slope water situation does not directly or indirectly affect or modify the official State action approving this project. Favorable action by your committee is respectfully requested.

Gentlemen, we have with us this morning, Senator Johnson, who is a joint sponsor of the bill.

Senator Johnson, if you will wait just a moment, we have the great pleasure of having with us Senator Butler of Nebraska who is chairman of the Interior and Insular Affairs Committee. This is a subcommittee called the subcommittee on Irrigation and Reclamation that will operate on this bill.

Senator Butler has been ill. He has staged a wonderful recovery. It lifts our hearts to see you here, Senator.

Senator BUTLER. It is a great pleasure to be here, Senator.

Senator MILLIKIN. Senator Johnson?

## STATEMENT OF HON. EDWIN C. JOHNSON, UNITED STATES SENATOR FROM THE STATE OF COLORADO

Senator JOHNSON. Mr. Chairman, I am very grateful for this courtesy and this privilege. I join you, although not a member of this committee, in extending greetings to our colleague, Senator Butler, from Nebraska. He does not look like he has been in a hospital. I hope he has not been playing hooky. He looks as though he had been playing golf some place. Nevertheless, however, that may be we are delighted that he is back and we are delighted that he has made the wonderful recovery.

Mr. Chairman, within my knowledge, no reclamation proposal which has been presented to the Congress from Colorado for approval, has been prepared with the meticulous care and forethought with respect to the protection of the interests and rights of all concerned as has this Fryingpan-Arkansas project.

Colorado is a semiarid State and water is her most precious resource. Quite naturally intense rivalry and jealousy exist in Colorado between private water users, between east slope and west slope interests, and among the four separate and distinct valleys or sections of the western slope. Water fights are bitter.

Accordingly Senator Millikin and I, who have the honor and the responsibility of representing the State as a whole, have insisted from the beginning that the promoters of the Fryingpan project draw up and submit its operating principles, its plan, and its scope, with all of its phases, objectives, and purposes to every constituent part of Colorado officialdom having any responsibility whatever with respect to the use and development of Colorado water.

All of this has been done and all concerned have approved. The Governor, the Colorado Water Conservation Board, and other State officials, have endorsed this project. The two western slope statutory boards charged with the specific duty of protecting their respective areas on any and all diversion proposals, by the unanimous vote of their directors approved it. These two western slope boards are the Colorado River Conservation District Board, and the Southwestern Colorado Conservation District Board. Pressure has been brought upon them to change their position, but they have stood pat. Hence Colorado is coming before this committee and the Congress with every-

one in Colorado fully advised with respect to the project and with a united official front supporting it.

I wish to take advantage of this opportunity to commend those who have labored so long and so faithfully, for the thorough and faithful way they have done their work.

Hardly any beneficial program of a public nature can be developed without injuring some private interest. That would be true whether the improvement be a public highway, a public canal, or a public reservoir. It is doubtless true that the proposed Aspen Reservoir may injure someone, but certainly he will be compensated in full. But I do want to emphasize with all the force at my command that the Aspen compensating reservoir is very valuable to the western slope as a whole. This replacement facility, to be constructed without cost to the western slope, has a capacity of 28,000 acre-feet. It will insure the water users and the potential water users on the Fryingpan and the Roaring Fork in seasons of low water, a dependable supply of water, which heretofore they have not had. The floodwaters roaring down those streams in the early spring has long been a menace. The recreational value of this reservoir to Pitkin County and the western slope can hardly be overstated. Incidentally, the water to fill the Aspen Reservoir takes priority over diversion water.

Senator MILLIKIN. Senator Johnson, is it not your understanding that the area of inundation would be 640 or 600 acres, very small?

Senator JOHNSON. That is correct. Just above the town of Aspen.

Senator JACKSON. What is involved in the 640 acres?

Senator JOHNSON. Ranch land.

Senator JACKSON. Is that all that is involved, a section?

Senator WATKINS. It is on the western slope?

Senator JOHNSON. Yes, it is on the western slope.

Perhaps something elementary should be said for the record about the natural division of Colorado into its two drainage slopes. The Continental Divide causes the waters of its east slope to drain into the Gulf of Mexico and the waters of the west slope into the Gulf of California.

The eastern slope has the burden of passing some of its water downstream to neighboring States. While the four Upper Colorado River States on the western slope, through an irrevocable and in my opinion an onerous compact, must deliver more than half of their water to the three lower States at Lees Ferry. Another considerable amount must go to Mexico. Under an agreement signed at Vernal, Utah, in 1948, Colorado also must deliver a considerable portion of its water to Utah and New Mexico.

The waters diverted from the western slope place no additional downstream burden on the eastern slope of Colorado, so such water becomes a net gain to the east slope and a net loss to the west slope so far as its burdens are concerned.

My home is on the western slope and Senator Millikin is a resident of the eastern slope. I am positive that both of us approach Colorado's east-west slope problems objectively and completely without prejudice. Our one desire is that as between them equity and justice prevail and in the best interests of both. We realize all too well that Colorado has a problem which must be faced realistically.

Senator MILLIKIN. Senator Johnson, I would like to endorse that wholeheartedly.

Senator JOHNSON. Thank you, Senator. I knew that would be your thinking on that subject.

Speaking for myself only, I want to make it crystal clear on the record that while I go along completely on approving the Fryingpan project with the Colorado River Conservation District boards representing the western slope interests and both boards being charged with the specific duty of protecting their respective districts on any and all problems of diversion, I go along with them without reservation in my support of the Fryingpan diversion, but in doing so I am making no commitment whatever with respect to any further transmountain diversion unless and until comprehensive and exhaustive studies and surveys prove conclusively that there is surplus water on the western slope over and above all of its potential domestic, industrial, and irrigation requirements. Furthermore, the burden of proof that there are surplus waters must rest upon those who would divert western slope water.

Since there are at least four distinct drainage areas on the western slope—the San Juan, the Gunnison, the Grand, and the White-Yampa-Green Rivers—early consideration of their problems must be arranged. These areas each should have their downstream burdens determined and spelled out at the earliest possible moment and before a grave and irreparable injustice is committed against any of them.

The need in the Arkansas Valley is critical and desperate. A way must be found to get this valley more domestic and irrigation water. The Fryingpan project was conceived with the idea of developing the most good out of the smallest possible volume of diverted western slope water. The reregulation of the Arkansas River from Leadville to Pueblo has that objective in mind. Under the plan approximately 185,000 acre-feet supplemental irrigation and municipal water would be provided at Pueblo out of a diversion of a little less than 85,000 acre feet from the western slope. That I would say is bordering on magic but competent engineers who have checked and double checked the plan say it can be done.

Senator MILLIKIN. That comes about, does it not, through so-called reregulation?

Senator JOHNSON. That is right.

Senator MILLIKIN. They capture and reservoir waters which would run off in the spring floods and be irrecoverable as far as Colorado is concerned. They put those waters in reservoirs and let the water out when needed so that a small amount of water does produce the results which you have referred to.

Senator JOHNSON. That, of course, is correct. The reservoir above Pueblo gathers winter water which is of no value. They cannot irrigate in the wintertime, and it gathers what water comes down in the wintertime and holds it until the growing season, and then gives it to the irrigators for their use when it will be of some value. That is the way it is done.

It is not an impossible plan. I do not mean to imply that it is. Engineers have approved it and say that it is all right, but it does indicate a point that is terrifically important. Over there on the western slope when they get a little water, then by careful husbanding of that water they are able really to get some results.

Senator WATKINS. How do they get it over to the east slope? Do they run it through a tuunel already existing?

Senator JOHNSON. They have to build a 6-mile tunnel. That is the way they get it across the mountains.

Senator MILLIKIN. These things are all more or less self-evident to people who come from irrigation communities, but for the benefit of those who do not, it might be well to note that under proper water use there is always a multiplier factor in use and reuse. A certain amount of water is put on the land. A part of that comes back to the stream and is used again and again. In that way we multiply the beneficial effect out of a certain amount of water which otherwise might be lost.

Senator JOHNSON. That, of course, is correct. I have been told by engineers, and I presume they know, that some of the water on the South Platte River from Welby to the Nebraska State line is used four times in its course down the river. Of course, there is a certain amount of it that is consumed each time it is used, but there is a portion of it which goes on down the stream. That is true here.

Then, another point is that where you increase the volume in a river like the Arkansas, the water moves with less loss, much less loss. It moves faster and it does not have the loss it does if you have a stream at low ebb.

The 320,000 acres of irrigated Arkansas Valley land suffers an average annual shortage of water which is estimated by the experts in the Bureau of Reclamation to be 35 percent of headgate requirements. Talk about a desperate need for water—trying to irrigate with a shortage which averages 35 percent short.

Senator MILLIKIN. Which means that sometimes there is a shortage up to 85 percent to make up that average?

Senator JOHNSON. That is correct.

Now, let us see what it is that this project does to that shortage. Here is where your magic comes in, the magic of good husbandry of water and the magic of getting the most out of what you have.

With the Fryingpan project in operation in 17 years out of 34 these experts say the shortage of water would be eliminated entirely and the average shortage would be reduced from 35 percent to 16 percent. As an experienced irrigation farmer, I would say production of irrigated crops easily would be increased 50 percent with an adequate supply of water while the costs of farming with this increased yield would increase very little. It costs almost as much to produce a poor crop as a good crop. John Beaty, a native son of the Arkansas Valley and a man with vast farming, merchandizing, banking, and water experience, estimates that at present prices the additional water from this project will mean $7 million additional farm income annually to the Arkansas Valley. Such an income over a 50-year period is $350 million.

Southeastern Colorado has a very great need for additional hydroelectric power, too. There is practically no limit to its electric energy requirements. My office receives many pressing inquiries from would-be users regarding the construction of the Fryingpan multiple-purpose project. The 500 million kilowatt-hours annual production of energy will be gobbled up by the power-hungry people like starved turkeys devouring grasshoppers.

Senator Watkins, I am sure, knows how that is done, being as he does come from a great turkey-growing State, and maybe they have a few grasshoppers out there.

Senator WATKINS. Incidentally, I raised turkeys once and I raised them for the purpose of cleaning up the grasshoppers on the ranch I was operating.

Senator JACKSON. How much firm power will this produce?

Senator JOHNSON. I cannot say how much firm power, but the Bureau of Reclamation tells me that it will produce 505 million kilowatt-hours. They have 7 powerplants down the river. As this water goes down the river they catch it.

Senator JACKSON. At the various drops?

Senator JOHNSON. Yes, at various points. They have a total of 7 of these hydroelectric plants, the last one at Pueblo.

Senator MILLIKIN. Can any one in the audience tell us how much firm power will be produced?

DAN HUNTER (president, Southwestern Colorado Water Conservation District). 400 million kilowatt-hours of firm power and 100 million kilowatt-hours of standby power.

Senator JOHNSON. Dan says it will be 400 million firm power, but there is plenty of coal in that region and it can be firmed up easily enough. There are steam plants already creating electric energy which could firm it up.

Senator MILLIKIN. I understand there will be some power from C. F. & I. installation that will have a firming effect.

Senator JOHNSON. Yes, that is my understanding, too.

Southeastern Colorado has a very great need for additional hydroelectric power, too. There is practically no limit to its electric energy requirements. My office receives many pressing inquiries from would-be users regarding the construction of the Fryingpan multiple-purpose project. The 500 million kilowatt-hours annual production of energy will be gobbled up by the power hungry people like starved turkeys devouring grasshoppers. Anyone who has any doubts about the reimbursement on schedule of the 25 percent of the total cost of the project allocated to powers is not familiar with the demand for hydroelectric power in Colorado.

The two large, splendidly managed private power companies serving this general area are supporting the Fryingpan project. They told me so themselves personally. This is what they say for the record:

> Our companies believe it is only sound economics to develop incidental byproduct hydroelectric power in connection with reclamation projects when power generation is economically feasible.

This is the first instance I can remember when private power interests have given their blessing to a public power project.

Senator MILLIKIN. May I say, Senator Johnson, that had the other utility companies been equally foresighted, the utilities would not be in the trouble they are today?

Senator JOHNSON. I agree wholeheartedly in that.

Senator JACKSON. I can join with you in that, too. If they had not opposed a lot of these projects in the past I do not think they would have the difficulty in convincing the public of their present intentions.

Senator ANDERSON. Senator Johnson, you read a part of the statement by these power companies. Can you tell me what they mean

by the last sentence in that same paragraph? The last sentence reads:

> We do believe, however, that it is highly inappropriate for the Government to construct transmission lines where such facilities can be provided by private capital and where existing facilities can be used.

Senator JOHNSON. The interpretation of their papers is an argument for the use of their transmission lines, which is an argument that I did not go into in this statement of mine. It is one of the things that can be worked out and developed. Congress has dealt with that problem a long time, and how they want to deal with this particular problem I do not know.

Reclamation already does have with the Public Service Co. of Colorado, a relationship in taking care of the wheeling charge of electric energy. We have it in the Big Thompson and Green Mountain reservoirs in transmitting power to the San Luis Valley in Colorado and to Gunnison and to Salida. Reclamation has a working agreement with the Public Service Co. They make the argument that this project should also follow that precedent. To what extent they do that is one of the details which will have to be worked out later.

During World War II, the Arkansas Valley was the location for many important military installations. Peterson Field, headquarters for the 7th Air Force; Camp Carson, the Pueblo Ordnance Depot; the Pueblo Air Base, and the La Junta Bomber Squadron Air Base, are all located in this general area. The vital nature of such defense installations alone completely justifies and makes mandatory the municipal water supply phase of this project. You will recall, too, that the domestic water supply phase calls for only 8 percent of the total water involved in this project, 92 percent of it being for irrigation and reclamation.

The Arkansas Valley is blessed with fertile soil and an almost perfect general crop growing climate. Its farmers and ranchers are second and third generation tillers of the soil in this valley. They are alert, well established, well equipped, and thoroughly experienced in the art of growing crops on irrigated farms. Because of the superior qualities of the people, both rural and urban, residing in the Arkansas Valley in Colorado, I have the faith to believe that this project will prove to be an outstanding success. The combination of superior soil, superior climate, and superior people absolutely assures the success of the Fryingpan transmountain diversion. On that point I am positive.

I would like to read into the record a telegram which I received this morning addressed to me. It reads as follows:

> Please inform Senate Interior and Insular Affairs Committee in connection with the current hearings on the Fryingpan-Arkansas project that the city of Pueblo must procure additional sources of water to survive. All sources of water east of the Continental Divide have been exhausted and required additional supply must come from Colorado River tributaries. Pueblo currently contemplates substantial additional capital improvements in connection with its south side distribution system. We realize the costs per acre-foot are high but water is worth just what it costs. We are willing to negotiate for additional supplies from the Fryingpan-Arkansas project. We will appreciate your efforts to assist us.
>
> W. H. COOZE,
> *Chairman of the Board, District No. 1.*
> Ed MCCABE,
> *Chairman of the Board, District No. 2.*

Senator MILLIKIN. Thank you very much, Senator, for a very splendid statement.

Are there any questions?

Senator ANDERSON. I want to ask one question of Senator Johnson.

You stated in your statement that you went along with these people on the eastern slope—

without reservation in my support of the Fryingpan diversion, but in doing so I am making no commitment whatever with respect to any further transmountain diversion.

Does that refer to transmountain diversions in the State of Colorado?

Senator JOHNSON. That is right.

Senator ANDERSON. We have one in our State and I am quite sure that you were not trying to comment on that.

Senator JOHNSON. No, indeed. I had in mind the use of water on the east slope of Colorado. That is what I was referring to.

Senator JACKSON. I have no questions, Mr. Chairman. I think that was a very fine statement of the problem in Colorado. Coming from a State where we have a lot of problems of a little different nature, I can well appreciate your problem where you are extremely short of water.

Senator JOHNSON. Thank you, Senator.

Senator ANDERSON. Senator Johnson, you are very familiar with the development of the supply of water under Hoover Dam?

Senator JOHNSON. Yes.

Senator ANDERSON. You are familiar with the fact that water which could have been used perhaps to irrigate along the Colorado River has been brought into the city of Los Angeles and has made it a tremendous and dynamic city, and that the electric current generated at Hoover Dam to a great degree has been brought into Los Angeles and surrounding areas, and has been utilized there.

Do you see anything harmful in that principle? That is the very principle which is in use here. Some people have contended that the water ought to have been left along the Colorado River. It has made Los Angeles a great city and I think has contributed to the welfare of all the country.

Senator JOHNSON. My views are that all the water that can be used along the Colorado River and its drainage basin ought to be used on the Colorado River, but all of it cannot be used and certainly it ought to be put to beneficial use. That problem was worked out in the seven-State compact that was drawn up.

No, I do not see anything evil about the use of the water at Los Angeles.

Senator ANDERSON. The people of California determined they wanted to use it at Los Angeles. Part of the power from Hoover Dam was allocated to the State of New Mexico. The State of New Mexico had no facilities whatever for building a transmission line out to Lake Mead at the site of the dam and to bring that current back to New Mexico. We were permitted to do it. We were not able to do it. It therefore moved into the Los Angeles area and contributed to the development of that great city. I see nothing wrong with that inasmuch as we could not make use of it.

Senator JOHNSON. So long as California is reasonable, and so long as they work cooperatively in the interests of the States, of course

there is nothing wrong. If they get out of line and want more than their share, we will have to resist them.

Senator ANDERSON. As I understand it, your project would say that the water which Colorado has in the Colorado River—and we all recognize its right to it—can be utilized by the people of Colorado for what will best promote the interests of Colorado, and that you are trying to make use of it to see that the interests of Colorado are served and that it does not go to waste.

Senator JOHNSON. That is right, the surplus water. I want to make it very plain that I want the western slope of Colorado fully protected in its potential uses and its present uses, and then if Colorado has a surplus—as the Senator from New Mexico knows, at the Vernal conference it was decided that Colorado would have 15.75 percent consumptive use of its share of the Colorado River water. If we use the other east slope, we cannot use the other western slope, and it will be charged to us.

Senator MILLIKIN. We do not take any water away from any other State by diverting to the eastern slope. We are only using that part of the water which has been allocated us in the upper Colorado River Basin compact.

Senator JOHNSON. That is correct, and I am glad that the Senator brought out that point because we do not want this project to get into any interstate feud, and it is not one.

Senator ANDERSON. That was the purpose of my question, Senator Johnson. I recognize the right of the people of Colorado to make a determination on how best this water should be utilized. That would therefore leave this committee with the task of passing upon the feasibility of the project and not upon the controversies there may be within the State of Colorado as to how best to use that water.

I think if there has been a decision reached, if the legislature has decided what they want to do with it, and the various governing boards have decided, then we can go ahead and pass on the feasibility of the project itself without getting into that question. That was the whole point of my inquiry to you.

Senator JOHNSON. And of course the portion that the great State of New Mexico uses will be determined by the State of New Mexico.

Senator ANDERSON. We are not jeopardized at all by your utilization of this water in case you decide to use it. If we had not had a compact we might be very much interested in this, but you have agreed that Colorado will receive 51 percent and New Mexico receives, I think, 16 or 17 percent. I have forgotten what. It comes down to 875,000 acre-feet. As long as we get our 875,000 acre-feet, and you get your water, you can then make disposition of it.

I did want to bring out that you are not jeopardizing us or any other State in the upper division or any State in the lower division by this utilization of this water if you wish to make it.

Senator JOHNSON. I am very grateful to the Senator for that clarifying statement.

Senator JACKSON. May I ask, is there any problem in connection with the time of the year in which the water is diverted as it affects the downstream operations, for instance at Hoover Dam and Lake Mead? The time of the year when the water will be diverted?

Senator MILLIKIN. Of course, I hope we are coming into what is called the Colorado River storage project. The purpose of that

project will be to regulate the flows of the whole stream so that the obligation to the lower basin States will be fully met. We feel that to have assurance that it will be fully met will have to come into the upper Colorado River Basin storage project, but that is not involved here.

I would like to emphasize again that it is my understanding, as far as this particular project is concerned, there is no disagreement about the right of this project to the water that is involved. There have been a few protests from landowners who will be inundated to the extent that already has been indicated, and a few very local protests, but the great water association that control the water of the western slope are for this project. You heard the telegram from Governor Thornton this morning reaffirming that the State of Colorado is for this project.

Senator JOHNSON. I am very grately to you, Senator, and to the committee for permitting me to appear.

Senator MILLIKIN. Thank you very much Senator.

Is Congressman Chenoweth in the room? Congressman Chenoweth is the sponsor of a similar bill in the House of Representatives and comes from the east slope district which takes in this project area.

## STATEMENT OF HON. J. EDGAR CHENOWETH, UNITED STATES REPRESENTATIVE FROM THE STATE OF COLORADO

Representative CHENOWETH. Mr. Chairman and members of the committee, I appreciate this opportunity to appear before you today in support of this legislation.

I introduced a companion bill, H. R. 236, in the House. Hearings were held on this bill last week by the House Committee on Irrigation and Reclamation. I hope that that committee may see fit to report that bill at an early date to the House.

Mr. Chairman, I want personally—and I am sure on behalf of everyone who is interested in the Fryingpan-Arkansas project—to acknowledge and to express to you and to Senator Johnson our gratitude and appreciation for the support and cooperation and assistance which you have given on this project. I am sure that we would not have been able to have had the House hearings, and this hearing would not have been held today, except for your unflagging interest and that of Senator Johnson in this project. I am sure it is deeply appreciated by the citizens of Colorado. I am sure that everyone here today from Colorado in behalf of this project would want me to so express it to you.

Senator MILLIKIN. It takes two Houses to pass a bill, Senator. We are very glad to help on this side, but your efforts on the House side have been monumental.

Senator ANDERSON. Sometimes it takes 3 Houses to get 1 through.

Representative CHENOWETH. I am not going to take the time, members of the committee, to go into the details of this project. I want fully to concur in the fine statement which Senator Johnson has submitted to the committee. It expresses in detail what I have in mind, and I do not want to repeat.

I just want to remind the committee—you, Mr. Chairman, do not need to be reminded of the fact—that there is intense interest in this

project in every section of Colorado, as will be fully explained to you by the witnesses from Colorado who are here.

For many years it has been the dream of persons in the Arkansas Valley who realize the need of additional water that we might be able to construct a transmountain diversion project which would bring excess water—I want to stress the words "excess water" as Senator Johnson did—from the western slope to the eastern slope to provide supplemental water for irrigation and badly needed water for domestic purposes.

This hearing today, Mr. Chairman, is the culmination of the efforts of many persons over a long period of years. I think I can personally recall that this project has been discussed over a period of 20 years. The Bureau of Reclamation has been working on this project over a period of 10 years. This project is not before you today as the result of any hasty or ill-conceived or immature action. It is the result of long study and careful planning.

I want to remind the committee that this project has had the approval of two administrations. In October of 1951, Oscar L. Chapman, then Secretary of the Interior, approved this project and sent it to the Bureau of the Budget. When the new administration came in in January of this year the Director of the Budget returned the project to the Secretary of the Interior for his recommendation. Again, I believe on April 28, Secretary of the Interior, Mr. McKay, approved the project. So, for the second time it has been approved by the Secretary of the Interior. So under two administrations this project has been approved.

Senator MILLIKIN. The second approval was not merely perfunctory. Is it not true that it was sent back to the Budget so that the Budget might have a new review and a new review was given in the Department of the Interior?

Representative CHENOWETH. That is right. A very careful study was given a second time. I mention that to show this has been under consideration for a long time and it has had the approval of two different administrations.

Senator ANDERSON. Does the Department of the Interior report carry the endorsement of the Bureau of the Budget as well?

Representative CHENOWETH. The Bureau of the Budget last week, I believe on June 6, wrote the usual letter which I am sure will be presented to the committee giving the Secretary of the Interior the authority to present his report, and the report provides for the approval of this project. The details of the project are contained in Senate Document 106, 82d Congress, 2d session, and those details will be fully explained to the committee by expert witnesses.

Senator JACKSON. Have there been any changes in the project from the recommendation made, was it 2 years ago?

Representative CHENOWETH. I think none whatever, Senator. There has been a change in the cost of the project due to the fluctuation in the prices of materials and construction costs, which will be explained to you, but there has been no change in the project.

Senator ANDERSON. I want to refer just briefly to the question you raised with Senator Johnson a moment ago as to the situation in Colorado. It will be more fully explained by the attorney and engineer for the Colorado Water Conservation Board, which has

officially and unanimously approved this project. That is the board which speaks officially for the State of Colorado on water matters.

Senator ANDERSON. Thank you. I had two points in raising the question with Senator Johnson. First, he said he was going to be against any other diversion from the west to the east. We have a diversion project in New Mexico, and I am perfectly willing to stay out of his backyard, but I did not want him to get into mine. I wanted to be sure we understood each other, and I knew we did.

Secondly, I have been involved in many discussions and arguments in New Mexico as to the right to use a State's supply of water where the State decides it should be used. I think the State of California was wise in making use of Colorado River water for the domestic uses of Los Angeles rather than for certain irrigation uses, perhaps. I think it was wise in using power out there. I think that the State of California had the right to make that decision, provided it did not deprive some water user of his established rights. I think the State of Colorado has the same right that the State of California has. I hope the State of New Mexico has the same right as well, and I believe that our present administration agrees with that position. That was the reason I wanted to bring it out.

I am very glad to have you say, as Senator Johnson said, that this does not disturb the plans of any other State.

Representative CHENOWETH. That is right.

Senator ANDERSON. May I ask you a little bit about the surplus water? In the hearings before the House, was there any testimony to indicate why this water was surplus? Is the western slope unable to use it?

Representative CHENOWETH. I think that is true, Senator Anderson. The water is now going down the Colorado River out of the State of Colorado. We are not taking advantage in using to the fullest extent the water which has been allocated to us under the upper Colorado River compact.

Senator ANDERSON. There are not projects scheduled which would utilize the water on the western slope?

Representative CHENOWETH. None that I know of, Senator. I might state tha under the supervision and direction of the Colorado River Conservation Board, there is a policy committee as I believe it is referred to, set up, and repeated conferences were held between the water users of the western and eastern slopes.

The operating principles for this project have been agreed to and are contained in Senate Document 106, which fully explains the relation between the eastern and western slope so far as this project is concerned.

Senator, I am sure that the State of Colorado would not expect this committee to referee any dispute or contest which exists within the State of Colorado. That has been settled before we came to you.

Senator ANDERSON. Precisely. That is exactly the point that I was trying to make. We need not spend our time in trying to decide whether the State of Colorado did the wise thing or not.

Representative CHENOWETH. That is right.

Senator ANDERSON. It has to be assumed that the State of Colorado did the wise thing, in my opinion, and then we pass on the feasibility of the project.

Senator MILLIKIN. That is right. The Representatives of Colorado in Congrdss have steadfastly maintained "don't bring anything down here until you have complete agreement within the State of Colorado."

Senator ANDERSON. Furthermore, there has been some testimony as to the place where this water would be utilized. I am sure Congressman Chenoweth, you have been through all the area running from La Junta to Las Animas, and right on through to the Kansas line. Is that not Holly Sugar section in there?

Representative CHENOWETH. Holly Sugar has its plant at Swink, Colo. There are three sugar plants in there, Holly——

Senator ANDERSON. Lamar?

Representative CHENOWETH. There is no plant at Lamar. There was a plant at Holly. I guess that is where the name was originally derived. The plant has been moved up to Swink. American Crystal has one at Rocky Ford and Holly has one at Swink, and National Sugar has a plant at Sugar City. So there are three sugar beet plants in the Arkansas Valley.

Senator ANDERSON. You mentioned Rocky Ford. That is a pretty well-known name in the cantaloup business, is it not?

Representative CHENOWETH. I received a letter this morning inviting me to Watermelon Day at Rocky Ford, and I am sure they would want me to extend that invitation to all of you. That is one of the outstanding events of the West.

Senator ANDERSON. What is the elevation of the land at Lamar, Las Animas and La Junta, for example, as compared to the areas in the headwaters?

Representative CHENOWETH. Much lower. I think La Junta is about 4,500.

Senator ANDERSON. Does that give you a longer growing season?

Representative CHENOWETH. Oh, yes.

Senator ANDERSON. Does it give you opportunity for greater increased production from an acre to which water is supplied?

Representative CHENOWETH. Yes; La Junta and Rocky Ford or in Otero County. One of the citizens of Otero County, who is a physician and who has made a study of this over the years, told me that Otero County ships more agricultural products in carload lots than any other county in the United States. He is a man in whose judgment I have confidence. He is in position to know whereof he speaks. I think that is true, Senator. That gives you an idea of the intense agricultural development of that area.

The supplemental water is needed to complete those crops. As Senator Johnson told you in his statement, he mentioned something like $50 million over a period which would be the benefit which would accrue. It is almost impossible to estimate the advantage there would be if they had the water when they needed it.

Senator ANDERSON. What I wanted to get to was that it takes a relatively high amount of money these days to carry water in a canal anywhere in the West, to build diversion dams and to build headgates and to do all the rest of the things that you have to do. If that water goes to an area that only produces 1½ crops of alfalfa, it is not nearly as valuable as down near Yuma, Ariz., where they have 5 crops a year. While that is an extreme, that same water is better used on the land with the lower construction costs in the area surrounding

Lamar, Las Animas, and La Junta than it would if it were held in the higher reaches of Colorado where the growing season is relatively short.

Representative CHENOWETH. I believe the Arkansas Valley would be recognized as one of the most fertile and productive valleys in the entire United States. I hope you will come visit us on Watermelon Day at Rocky Ford and see for yourself something of that.

Senator ANDERSON. I grew some cantaloups one time in competition to Rocky Ford cantaloups and I learned quickly that that was not a good occupation.

Representative CHENOWETH. We distribute cantaloup seeds all over the world, Senator. I am happy to have had this opportunity, Mr. Chairman, to add my endorsement and full support of this legislation which is before you. I need not remind you of the situation in Colorado which calls for action on this project and the desperate need for this water which exists.

Mr. Chairman, I want again to express my personal appreciation and that of the others who are here from Colorado for your consideration and for the opportunity to appear, and the fact that you are holding these hearings and giving us an opportunity to appear before you.

Senator MILLIKIN. The committee has been very fine about that. When they learned that all these gentlemen would be here on the House side, we went to extraordinary measures so that they could appear here. As you see, the main committee was in session until 10:30 this morning finishing the bill on the tidelands legislation, but they were very glad to make way for us so that we could have this subcommittee hearing.

We are very glad to have you.

Representative CHENOWETH. We deeply appreciate the consideration which has been shown us, Senator, by you and the other members of the committee, in being present for this hearing. I cannot overemphasize the intense interest in, and the need for, this project. I hope that the committee will be able to give it its favorable consideration and early approval. I can assure you that the people of Colorado will be deeply grateful for that action.

Senator MILLIKIN. Thank you, Congressman.

Senator Anderson, you mentioned altitude a while ago. At Leadville, which is the highest part on the eastern slope, the altitude is 10,182 feet. At Canon City, coming on down near Arkansas, it is 5,343 feet. At Pueblo, it is 4,808 feet; Rocky Ford is 4,117 feet; Lamar is 3,615 feet. Translated into terms of frost-free periods, which is the point that you were getting at, at Leadville, you have 83 days frost free; Canon City, 168; Pueblo, 173; Wocky Ford, 165 Lamar, 168.

Senator ANDERSON. Thank you, Mr. Chairman. I raised the question because I have been contending in my own State that where we have such limited supplies of water we ought to try to put that water where the longest growing season might be, where the greatest variety of crops could be produced, and where the best cash crops might be produced, and thereby contribute to the general prosperity not only of our State, but to the ability to pay back these projects.

In my opinion, that area in Colorado which stretches along the Arkansas River is an extremely fine agricultural area. It would seem

to me that it would be the part of wisdom to try to put this water at a relatively low altitude, three to four thousand feet, instead of trying to use it above 5,500 feet or at 6,000 feet, where you know the growing season is extremely limited.

Senator MILLIKIN. That is the plan.

Governor Aandahl, we are very glad to have you here. The Governor is Assistant Secretary of the Interior and is Acting Director of the Bureau of Reclamation.

## STATEMENT OF FRED G. AANDAHL, ASSISTANT SECRETARY OF INTERIOR, ACCOMPANIED BY GEROGE E. TOMLINSON, ASSISTANT DIRECTOR OF PROJECT PLANNING, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR

Governor AANDAHL. Mr. Chairman and members of the committee, I appreciate the privilege of appearing before your committee this morning and making an observation or two about the Fryingpan-Arkansas project. During the short period of time that I have been with the Department of the Interior I have come to look at this project as one of the very good projects that we have to submit to the Congress and to discuss with the Congress.

May I remind the committee that the regional director of region 7 at Denver, Colo., submitted the report on this project on July 5, 1950, and that report was revised on February 23, 1951. On October 19, 1951, the former Secretary of the Interior, Mr. Chapman, submitted a report on the Fryingpan-Arkansas project, Colorado, to the Bureau of the Budget. On January 27, 1953, the Director of the Bureau of the Budget, Mr. Dodge, returned the report to the new Secretary of the Interior for such revision and comments as he wished to make. Under date of April 30, 1953, Secretary McKay sent his comments to the Director of the Bureau of the Budget and to the President.

In the letter of April 30 to the President——

Senator MILLIKIN. Governor Aandahl, I think what you said gives emphasis to the point which has already been made: That this is not hasty, rapid, ill-conceived, but it has been reviewed a number of times in your own Department, and at the grass roots for a long period of time was considered before it ever came up, as a matter of act.

Governor AANDAHL. Yes, that is correct.

The thing that I now present is modifications that are being suggested by the Department of the Interior at the present time. In this letter of April 30 to the President, Secretary McKay states that—

> no modification in the plan of development is required. However, the recommendations in the report are hereby modified.

The first modification is to recommend that instead of using the so-called interest component to assist in repayment of the investment for irrigation, the aid that is to come from the sale of hydroelectric power and municipal water shall not be used to repay irrigation costs until after the investment in hydroelectric power and in municipal water with interest has been fully repaid.

Senator MILLIKIN. That is the so-called Collbran formula.

Governor AANDAHL. It is a modification of the Collbran formula.

After those investments have been repaid with interest, then revenue from power and revenue from the sale of municipal water are to be used as an aid to repay irrigation costs.

Senator JACKSON. For the record I think it might be helpful to just make a brief statement on the interest component theory.

As I understand, interest is charged on the power features as well as the repayment of the principal cost.

Governor AANDAHL. That is right.

Senator JACKSON. The interest component theory would permit the use of the interest earned on the power feature to be applied on the irrigation features.

Governor AANDAHL. That is, from year to year.

Senator JACKSON. I am merely asking this, Mr. Chairman, so we clarify the record.

Senator MILLIKIN. I think it is a good idea.

Senator JACKSON. From the previous report it was suggested that the money that accumulates—that is, the interest has accumulated in the account, interest being on the power features—would be made available to apply against the capital costs on the irrigation aspects of the project. Is that right?

Governor AANDAHL. Yes.

Senator JACKSON. Under the modified proposal, then, the interest component which is set up would not be available for that purpose until the power features had beeen amortized, is that right?

Governor AANDAHL. Yes. Then the full net revenue from power can be used as an aid to irrigation from that point on.

Senator JACKSON. That would be the net revenue from the power project?

Governor AANDAHL. Yes, it would be the amount that formerly was used to pay interest and also the amount that was formerly used to retire the investment.

Senator JACKSON. What does that do to the amortization period on the irrigation feature?

Governor AANDAHL. It lengthens the amortization period. If the interest component were used to amortize irrigation investment during the power payout period, the irrigation investment would be paid off that much faster.

Senator JACKSON. In 50 years?

Governor AANDAHL. Under this project it could be paid in 50 years, I think.

Senator JACKSON. As modified now it will take 65 years, I think according to the report.

Governor AANDAHL. Power and municipal water would be paid out in 50 years after the last installation has been completed.

Senator JACKSON. You date the repayment from the completion of each installation?

Governor AANDAHL. Yes.

Senator JACKSON. That always has been the rule, generally, on irrigation projects?

Governor AANDAHL. Yes.

Senator JACKSON. I know it is on power. You start to amortize your power features from the time each generator is placed on the line and goes into operation.

Governor AANDAHL. I might say there is at least one advantage in handling it this way. It definitely commits the revenue from power and from municipal water that comes from the area to the Federal Treasury over a longer period of time. If we use the interest component and at the end of the 50-year period when the entire investment has been amortized, there would be no further obligation as far as this project is concerned toward the Federal Treasury. Under the recommended way, the Federal Treasury is assured of a longer income from the project.

Senator MILLIKIN. The length applies to the irrigation allocation?

Governor AANDAHL. Yes.

Senator MILLIKIN. The power and municipal features presumably would have been taken care of in 50 years.

Governor AANDHAL. Yes.

Senator MILLIKIN. So the extension due to the Collbran formula would carry on the total period of the project and particularly extend the period of irrigation?

Governor AANDAHL. Yes. Insofar as during the last 19 years, the power and municipal water revenue is obligated to aid in irrigation. It becomes a source of revenue to the Federal Treasury during that period. From the national point of view, it makes the project more self-liquidating.

Senator ANDERSON. How much of a per-acre charge is there going to be against the land?

Governor AANDAHL. For the water?

Senator ANDERSON. Yes.

Governor AANDAHL. The diverted water brought from the west slope will carry a charge, I believe, of $5.40 an acre.

Senator ANDERSON. No, $72 million against——

Governor AANDAHL. An acre-foot, I mean.

Senator ANDERSON. How many acres are involved in this?

Governor AANDAHL. This water will intermingle with the recovered water of the Arkansas River and with the water that is being presently used, and it will become part of the water that will be available for the 322,000 acres. It is supplemental water.

Senator ANDERSON. Are there other obligations against that water? Are there other assessments on the land for irrigation?

Governor AANDAHL. I believe I will ask Mr. Tomlinson to answer that question.

Mr. TOMLINSON. There will be some local witnesses to explain that in detail. They do have organized canal companies at the moment and they are, of course, making assessments and collecting for them. But the local people will be here to testify.

Senator ANDERSON. Does the Bureau not have information as to what the assessments are?

Mr. TOMLINSON. I do not think they do. I do not have it here. Mr. Powell, who will follow us, is from the area. He has the information readily available.

Senator ANDERSON. Do you know how much the total charge per acre will be after all these charges are put on?

Mr. POWELL. Senator, I do not carry in my head the entire figures for the valley, but the largest irrigated area near the State line, the 4-line canal, have an assessment this year of $1.25 an acre.

Senator ANDERSON. I am talking about principal assessment against the land, total assessment.

Mr. POWELL. That is total assessment, sir. That includes the operation and maintenance and retirement.

Senator ANDERSON. If they have land that has only a dollar an acre total assessment against it—I am not talking about the annual water charge. Do you mean that the total outstanding indebtedness is only a dollar an acre?

Mr. POWELL. They have no indebtedness, Senator.

Senator ANDERSON. That is what I asked. Is there no indebtedness, then?

Mr. POWELL. They have retired their entire indebtedness.

Senator ANDERSON. Fine. What will the debt be on the basis of this?

Mr. POWELL. They will have a charge to the Federal Government. Dividing the water delivery into the cost, it will come to about $250 an acre.

Senator ANDERSON. All of it will be supplemental water?

Senator MILLIKIN. All of it will be supplemental water, and the testimony will show that the people who will get the water will be very glad to pay for it. It takes them over that last growing hump by the use of supplemental that they need to perfect their crops.

Senator ANDERSON. $250 is a pretty high charge per acre for supplemental water assessment.

Senator MILLIKIN. They are perfectly willing to pay.

Senator ANDERSON. Do you have anything like that high in the Bureau?

Mr. TOMLINSON. I think we do have, sir. I do not have the figures before me, but we can submit them. We can look them up.

Senator ANDERSON. Do you have any even close to that? For a long time you had a limit.

Mr. TOMLINSON. Yes, sir.

Senator ANDERSON. What was that limit?

Mr. TOMLINSON. The limit for a long time was just the amount that they could pay in 40 years.

Senator ANDERSON. I thought you had more or less a yardstick. There was one carried in Federal law for a while, was there not?

Mr. TOMLINSON. I do not recall it, sir. There could be, but I do not recall it.

Senator JACKSON. What is the charge of the soil in this area? I assume it is highly productive?

Mr. TOMLINSON. Very good, sir; yes, sir. It is class I and II, mostly, and some class 6, as I recall it.

Senator JACKSON. The bulk of it is No. I?

Mr. TOMLINSON. Nos. I and II, I would say.

Senator ANDERSON. What is land selling for in that area now?

Mr. TOMLINSON. I do not know, Senator Anderson. I would prefer that we get that figure from the local people who are right here.

Senator ANDERSON. We will get to it later.

Senator MILLIKIN. We will come to it.

Senator CORDON. Are we to understand, Mr. Chairman, that there is no outstanding capital indebtedness on any of the lands which are to receive this supplemental water?

Senator ANDERSON. That was the testimony of Mr. Powell.

Senator CORDON. I want to be sure that he went just beyond that major area near the State line.

Mr. POWELL. Generally speaking, that is true.

Senator CORDON. That "generally speaking" is the thing I want to avoid. Do you know that it is true with respect to all of the land?

Mr. POWELL. I could not make a categorical statement, but I have the information and can make it available.

Senator CORDON. Will you make it available?

Mr. POWELL. I will, sir.

Senator CORDON. I think one of the main points that we want to develop and determine is the extent to which we are encumbering that land with capital investment indebtedness. The amount you indicate here of $250 an acre is a pretty sizable amount in itself. If in addition to that there is any other capital indebtedness of any consequence which must be repaid, in addition to the operation and maintenance charges which go on always, of course, that becomes an important factor.

Mr. POWELL. Senator, that is one of the main strength points of the project, that it is practically free from debt. But I can obtain the specific figures.

Senator CORDON. We want to know the amount of indebtedness, on what lands it rests, and the annual payments dedicated to the indebtedness as distinguished from the operation and maintenance costs.

(The requested information follows:)

*Irrigation indebtedness of the canal companies in Fryingpan-Arkansas project area*

| | |
|---|---|
| Total investment: | |
| 1940 | $16, 317, 477 |
| 1950 | 18, 633, 385 |
| Increased investment | 2, 315, 908 |
| Total indebtedness: | |
| 1940 | 3, 264, 804 |
| 1950 | 1, 823, 512 |
| Decreased indebtedness in 10 years | 1, 441, 292 |
| Average annual reduction | 144, 129 |

Senator ANDERSON. Mr. Nelson calls my attention to this report from the Bureau of the Budget, which points out that while $75 million is going to be charged against irrigation, only $31 million of that apparently is going to be paid by the farmers. It says:

> Thus, the water users would have paid $100 an acre out of a total investment of $243 per acre.

Where will the rest of it come from?

Governor AANDAHL. The power and municipal water revenues.

Senator ANDERSON. $40 million is going to be charged to power, and $32 million to municipal water supply?

Senator JACKSON. $75 million is allocated to irrigation, $41 million to power, $32 million to municipal water supply. Those are the reimbursable items. Then, $20 million to flood control and $2,800,000 to fish and wildlife, are the nonreimbursable items.

Senator ANDERSON. I see it goes on in this Bureau of the Budget letter and points out that the length of the project is going to run 70 years, 69 years, rather than 50 years. Apparently you contemplate

that the municipal water charge will be paid off at the end of 50 years, and the power charge will be paid off at the end of 50 years. Then both municipal water and power revenues will be added to farmers' payments for the last 20 years, so the farmers will then pay an additional $11 million and the $32 million will be met from revenues from power and municipal water supply?

Governor AANDAHL. Yes.

Senator ANDERSON. So the assessment against the farmers will be something in the neighborhood of $150 that you really expect them to pay?

Governor AANDAHL. Yes.

Senator ANDERSON. There isn't any such thing as a $250 debt, I do not believe, on a single project.

Senator CORDON. There would be that much debt, but not that much debt chargeable to the water.

Senator ANDERSON. That is what I mean.

Senator JACKSON. The report from the Bureau of the Budget to the Secretary indicates that the water users would have paid $100 per acre out of a total investment of $243.

Senator ANDERSON. But you have to read in the next paragraph and you see they are going to pay another $11 million on top of the $31 million they would pay, which would add another $25 or so, $30, so they will pay about $130 total. The balance of it will come from the sale of water for municipal supply and power revenues.

Senator JACKSON. I think it would be well to get a breakdown on that so we know just exactly how much capital indebtedness will lie against the acreage to which we are going to provide the supplemental water.

Mr. TOMLINSON. We will be glad to give you that. One of the witnesses has a nice colored chart showing the revenues characterized by sources in the pay out of this particular project.

Senator ANDERSON. I think sometimes it is a good thing to know how much the debt is against each acre of ground.

Mr. TOMLINSON. That can be done, sir.

Senator ANDERSON. There was a long time when $50 was considered the top limit, and then it got to be $100, and then it got to be more than that, but $250 would be rather high. Apparently it is about $120 on the basis of this.

Mr. TOMLINSON. That is the repayment, I think.

Senator ANDERSON. You do not have a project where the charge against the land which the land is expected to repay exceeds $150; do you?

Mr. LINEWEAVER. There are some exceptions, Senator Anderson, but that would be the general rule. I would have to check it up to make certain of it. I am somewhat of the opinion that $150 is the limit that you would charge against the land.

It should be understood, however, that that is the cost to the irrigation——

Senator ANDERSON. I understand that very well. We would not be able to build projects any more if you had to get it all out of the land with these increased costs. I am not worried about the size of it at all.

Mr. LINEWEAVER. I will check that up, Senator, and make certain. I think you are probably right.

Senator MILLIKIN. I think the inquiries of the Senators are very pertinent, and we hope you will give us that information.

(The information referred to follows:)

WATER CHARGES FOR SELECTED RECLAMATION PROJECTS

CACHUMA PROJECT, CALIFORNIA

This project, currently under construction near Santa Barbara, will provide both irrigation and municipal water service. Rate limits prescribed in the contract with the Santa Barbara County Water Agency are $25 per acre-foot for irrigation and $35 per acre-foot for municipal water. Payments at these rates for 50 years will be required for retirement of project costs. It is estimated that the construction component in these rates are $21 and $31 per acre-foot respectively.

Assuming that only 1 acre-foot per acre annually is used by irrigation, the construction repayment by irrigation in 50 years would amount to $1,050 per acre.

CENTRAL VALLEY PROJECT, CALIFORNIA

The Federal investment per irrigable acre in water supply facilities is estimated at $302 of which the irrigators would repay $200. In addition, water users will bear the full cost of constructing distribution systems, if the system is to be constructed by the United States.

San Joaquin Valley irrigators will pay up to $3.50 per acre-foot for irrigation water service from the Central Valley project. If 4 acre-feet of water are required annually, the per acre annual water service charge would amount to $14.

PAONIA PROJECT, COLORADO

Lands to be benefited by the Paonia project lie on both slopes of the valley of the North Fork of the Gunnison River, and have been irrigated and intensively cultivated for many years, the first water filings having been made in the early 1880's. Principal works consist of a storage reservoir, pumping plant, and two canals.

The Federal investment in irrigation facilities for this project amounts to $386 per acre, of which the irrigators would be expected to repay $136 in a period of 68 years following the close of 3 to 10 year development periods.

FORT SUMNER PROJECT, NEW MEXICO

Rehabilitation of the Fort Sumner project was in the nature of a supplemental water project, as works performed by the United States were designed to stabilize the irrigable acreage at 6,500 acres by more efficient distribution of the district's water supply and by improved drainage. Works consist of a new diversion dam, rehabilitation and enlargement of the canal system, pumping plant, and drainage systems.

Irrigators are under contract to repay an average of $4.75 per acre per year for a period of 80 years, or a total of $380 per acre.

VERMEJO PROJECT, NEW MEXICO

The Federal irrigation investment in this project is estimated at $375 per acre of which the irrigators would repay about $279 per acre in 76 years following the close of a 7-year development period.

Irrigation was first initiated in this semiarid area in 1888. The rehabilitation and reconstruction works to be undertaken by the United States will stabilize the irrigable area at about 7,200 acres by provision of an adequate water supply, an efficient distribution system, and adequate drainage.

Mr. TOMLINSON. Before we leave the lands, too, I looked up the classification of the lands, and of the 322,000 acres, 169,000 are class 1, 140,000 are class 2, and 13,000 are class 6 or other classes.

Senator JACKSON. I would say it is highly productive land on the average.

Mr. TOMLINSON. It is very good.

Senator MILLIKIN. Proceed, Governor.

Governor AANDAHL. The subject which has just been under consideration and the other paragraphs associated with it indicate that the Bureau of the Budget is of the opinion that these projects should pay out in a 50-year period. The Bureau of Reclamation and the Department of the Interior feel that a somewhat longer period can be advisedly taken. I might say that there are a number of these questions that have not been fully resolved in the executive branch, and we are laying them before the Congress.

The national water policy that is going to be followed will be arrived at by the coordination of the thinking and the cooperation of both the executive branch and the legislative branch. We know that there are many problems over on our side that in the short time we have been at it have not been fully resolved. This happens to be one of them, the question of whether we should use a period longer than 50 years to pay off projects.

Senator MILLIKIN. Governor Aandahl, may I suggest that it would be a very unfortunate thing if we were to confine repayment of irrigation projects to 50 years, or perhaps that might go even to power projects. Take the Wilson Dam on the Tennessee River, take the Hoover Dam, take your Grand Coulee, they have all been in existence for 20 to 30 years already and have not commenced to approach the end of their useful life. Had those projects been designed on the basis of a 50-year life, it would have been a very shortsighted thing to do.

I think that we who are concerned on the congressional side might as well abandon the thought that we can repay these reclamation projects, at least in their irrigation features, in 50 years. We have already learned that in this committee. To design projects for 50 years that would require their rebuilding or their rehabilitation at the end of 50 years, when we know they will still be good at the end of that time, as far as we can look into the future, would be a very shortsighted thing.

Governor AANDAHL. Personally, I have been of the opinion that we can recognize a period a little bit longer than the 50-year period, and that is what the Secretary of the Interior is doing when he sends this report over here with his recommendation for authorization of the project.

I was going further to call your attention to the last paragraph of the letter coming from the Bureau of the Budget in which the statement is made that—

> our review indicates that further study of various aspects of the project might be warranted. If, however, you deem it advisable, particularly in the light of the committee's desire for an early hearing, there would be no objection to the transmittal of the report.

The Department of the Interior is transmitting the report with its recommendation under that privilege.

Senator CORDON. Mr. Chairman.

Senator MILLIKIN. Senator Cordon.

Senator CORDON. I think from the policy standpoint, this committee should give careful consideration in the ensuing years—and I do not think we can do it in one—to the advisability of setting up a policy under which the reclamation fund might become the recipient of net revenue from power projects in the reclamation States built by the Federal Government, particularly if they happen to be recla-

mation projects. I am not at all certain we ought to limit ourselves to that inasmuch as that is a very arid area. It is an area that cannot live without water. I think we should give consideration to the wisdom of adopting a policy by which the net receipts from power projects after they have been fully repaid, with interest, be dedicated to the upbuilding of the area where they are located, namely, the reclamation States.

I think that is of enough importance to have the committee get on the job early and study it most carefully. There are a number of problems involved, including the natural feeding of a given area where there has been a power project; that it ought to have the benefit of those net revenues after the project has been completed.

In many other fields that has not been the case, namely, in connection with oil revenues, revenues from the sale of public lands, and so forth, and we might well broaden that and thus guarantee to the West a continuous development from net proceeds arising in the area to be dedicated.

Senator ANDERSON. I certainly agree with the Senator from Oregon. Actually, we have used up what seemed to be the best dam sites when the first dams were constructed. If we did not, we did not have good engineering advice. We tried to take the best ones, always, in every locality. That was the plan of the Government.

When you come to build a second dam when the first one silts up, it obviously is going to be more expensive, and not as favorable a ratio of benefits can be shown. Unless there is some putting away of these power revenues, you will not be able to have irrigation projects after a while.

I wonder a little bit at the third paragraph on page 2, where it says:

> Approximately 63 percent of the irrigation benefits of the project are of an indirect character, consisting of additional business from increased purchases, marketing, and processing activities. Without these indirect benefits the project over a period of 50 years would not show a favorable benefit-cost ratio.

Has the Department ever recommended a project that does not have a favorable benefit-cost ratio?

Governor AANDAHL. That is a bigger question than I could answer when you ask if it ever has.

Senator ANDERSON. Can you name one where it has recommended a project that does not have a favorable benefit-cost ratio?

Governor AANDAHL. I do not have any in mind.

Senator CORDON. The original Hell's Cayon did.

Senator MILLIKIN. That is not the case in this project, is it?

Senator ANDERSON. Apparently it is. Apparently they added in business benefits, which are not ordinarily added to these projects.

Senator JACKSON. I am a little confused on that, myself.

Governor AANDAHL. May I ask Mr. Tomlinson to explain the cost-benefit ratios as they have been tabulated.

Mr. TOMLINSON. There are two things involved here, sir. First, the length of the period. The report is based on using benefits for the life of the project or for 100 years, whichever is the shorter.

Senator ANDERSON. One hundred years?

Mr. TOMLINSON. Or the life of the project, whichever is shorter. In this case I think the reservoir does have a good and ample capacity to last 100 years. On the basis of 100 years, if we use the indirect and the direct benefits, we have a very high ratio, about 1½ to 1.

If we use only the direct—and there has been some question as to how much of the indirect benefits we should use, but I do not know of anyone who has said we should not use any of the indirect—then we get down to about a 1-to-1 ratio.

I might add that the Department appointed a board of consultants about a year or a year and a half ago, composed of professors from Columbia and Stanford and Montana State College, to look into this question of indirect benefits. They concluded that we should continue to use them, but as we may have been a little optimistic in evaluating them, they suggested we scale down our indirect benefits somewhat. Nevertheless they concluded that we should use indirect benefits.

Senator JACKSON. Have we used indirect benefits in the past?

Mr. TOMLINSON. We have used them consistently. I do not know of any report that the Bureau of Reclamation has submitted in the last 5 years that has not included both the direct and the indirect benefits in the economic evaluation of the project.

Senator ANDERSON. You have testified now as to reports for the last 5 years. In that 5 years was there a single report that did not show more than a 1-to-1 ratio on direct benefits?

Mr. TOMLINSON. I would not be surprised, Senator, if there were some. We did not separate the benefits out into the two categories for the benefit-cost ratio purposes. We merely said the total benefits were so much, the total economic costs were so much. The ratio of the benefits to the cost is whatever it turned out to be.

That is standard operating procedure, and this report is based on that assumption. If we limit benefits to just the direct, the ratio would drop from about 1½—I think it actually shows in the report as 1.48 to 1—to practically 1 to 1.

Senator MILLIKIN. It is 1.05.

Mr. TOMLINSON. Yes, sir.

If we limit those benefits to 50 years, then, of course, the present worth of an annuity running from now to 50 years from now is less than the present worth of an annuity running from today for 100 years. So it undoubtedly would be less than 1 to 1 based on the direct benefits alone in 50 years.

Senator ANDERSON. What was the actual figure based on direct benefits for 50 years?

Mr. TOMLINSON. As I recall it, sir, it was around 0.7. I would have to check that. It is plus or minus a small amount, for direct benefits only in 50 years.

Senator CORDON. Is that not another way of saying if the benefits equal the costs, your direct benefits being benefits to the water user, he would be able to pay it out in 40 years?

Mr. TOMLINSON. It is not quite that. It might lead you to somewhat the same general conclusion, but I do not think it necessarily follows.

Senator CORDON. In other words, there are direct benefits that the water user would not be required to repay?

Mr. TOMLINSON. They might not all be accruing directly to him. There might be some other direct benefits other than the benefits which he could actually put in the bank in the form of cash in a particular year. They may take some time to accrue. They may be accruing to others in the area, and so forth.

Senator CORDON. How could there be from this project? Do you count benefits that do not come directly from the project to the user of the water?

Mr. TOMLINSON. The point I was making was that he may not be able to bank all those benefits. It may result in capital improvements to his farm. He may have a better farm by virtue of it over a period of years.

Senator CORDON. The farm is better if he has water on it.

Mr. TOMLINSON. Yes, sir.

Senator CORDON. He pays for that.

Mr. TOMLINSON. That is right.

Senator ANDERSON. That is a pretty direct benefit.

Mr. TOMLINSON. Yes. It works in the same general manner, but I would not say it mathematically comes out to the same figure in each computation, for repayment and the benefits.

Senator CORDON. You will say this: that if a benefit that is credited to irrigation is one that the irrigator can not repay, then there are necessarily indirect benefits shown?

Mr. TOMLINSON. Yes. I would go even further than that, even beyond that indirect benefit, but at least to the extent you indicated.

Senator CORDON. That was my question.

Senator MILLIKIN. In our Colorado conservancy laws, we always recognize other than direct and immediate benefits. As the gentleman has said, as I understand it, this project you have not treated any differently than others, have you?

Mr. TOMLINSON. That is right.

Senator MILLIKIN. You have given the same weight to indirect benefits here that you have in others?

Mr. TOMLINSON. That is right.

Senator MILLIKIN. Of course, in the Federal interest, it is the indirect benefits that will yield more taxes to the Federal Treasury than the direct benefits. You have a multiplier factor in there of the stabilizing benefits, the general benefits to prosperity that come from an irrigated area which we have demonstrated so conclusively in the West, that yields the big revenue to the Federal Government in the form of taxes, and also to the prosperity and welfare of the people.

I remind you that in flood control, if you have equality of benefits against costs, including benefits to the general public interest, we authorize the project.

Senator CORDON. That is another field, Mr. Chairman, where this committee needs to make a thorough exploration and investigation and come up with some sound standards so they might be applied. I think we should work with the executive department and reach some sound standards whereby we can determine a yardstock to measure the reasonable total value to the Nation of a new or additional source of revenue. If we get that, it will save us a lot of time and trouble.

Senator MILLIKIN. The State of Colorado, for example, Senator, sends to the Federal Government about a half billion dollars in taxes a year. If we had not become a developed agricultural State, if we were simply a grazing State, I do not know how much less we would be be sending, but I will take a rough guess at it. We probably would be sending maybe $150 million. It is the developed agriculture of Colorado which forms the whole heart of our economy out there which yields that enormus revenue to the Federal Treasury.

You cannot count, in a project of this kind, all those benefits, but we need not be unconscious of them. We need not pass from our mind the great benefit to the Nation of a successful project.

Senator ANDERSON. I am a little worried about some of the language in this Bureau of the Budget report, however. Getting down towards the bottom of page 2, may I read it:

> As indicated by the comments of the Department of Agriculture on the original report, under dates of October 10, 1951, and May 23, 1952, in view of the obvious high cost of importing water from the Colorado River Basin, a separate evaluation should be made of the feasibility of importing water from the Colorado River Basin, considered as an incremental addition rather than an integral part of the project. Furthermore, there is no evidence in the report indicating a willingness by the irrigators to repay the proposed charges for an average annual supplemental water supply of about one-half acre-foot per acre.

So there are two subjects there that would require some statement by you, and then a third one. It says:

> Plans for municipal water supplies appear boubtful because of the high water rates, optimistic estimates of average water deliveries, and uncertainty of including all proposed facilities and functions in the ultimate plans.

Would you just take those three things and help us with them? Has there been any separate evaluation made on this importation of water from the Colorado River Basin?

Governor AANDAHL. I would like to make a general statement, and then ask Mr. Tomlinson to fill in the detail.

It is my understanding that the importation of water alone would not stand as a separate project, nor would the development of the additional resources of the Arkansas River stand alone, because they are both tied in with power revenues, and you have to have both sources of water to develop the power that can be developed by the joint project.

With respect to the willingness of the local people to pay the charges that will have to be made as a result of this project, I think we will have to depend on those who are here who represent the State, who represent the area, and I think they have affirmative statements to that effect.

Senator MILLIKIN. In point of law, Senator Anderson, the working plan provides that there will be nothing done until suitable contracts have been made with the water districts. So I think we have complete protection on that.

Senator ANDERSON. Yes, but it would seem to me there ought to be some evidence in the record, since the Bureau of the Budget report, I assume, has been made a part of the record——

Senator MILLIKIN. I think your Report No. 106, the working plan, has definite provisions for responsible contracts with water authorities out there and with municipal authorities, to assure that these things will be done before there will be an operating plan.

Senator ANDERSON. On this municipal water supply, when we were considering that Panhandle project on the plains of Texas, where we were asked to appropriate some $90 million or to permit it to be supplied for a municipal water supply for Amarillo and western Texas cities, when it came down to the question of the community actually being willing to close down its existing pumps and to take this water if it was made available, it developed that there was a good deal of question as to whether the water sales could be made.

Would you have one of your people at an appropriate time discuss this section on municipal water supply? In view of the fact that the Bureau of the Budget has raised it, obviously they must have had something which caused them to raise it. If there is some uncertainty about including these proposed facilities and functions in the ultimate plans, it would seem to me we ought to have some statement on that from you.

Do you know anything about what is contemplated now in the way of municipal revenues, how much water has to be sold to Pueblo, how much water has to be sold to Trinidad or Walsenburg or wherever it is supposed to go?

Governor AANDAHL. The plan anticipates the sale of 15,000 to 17,000 acre-feet of water for municipal use. I suggest when Mr. Powell appears, or he can do it now, he make some statement as to the possibility of selling that water.

The question should also be answered by the local people who are here to appear before the committee.

Senator ANDERSON. Would the chairman mind if Mr. Powell answered that question now?

Senator MILLIKIN. I wish he would.

Senator ANDERSON. Mr. Powell, would you mind answering what the possibilities are for the sale of this water, and to what communities?

Mr. POWELL. The water is scheduled for sale as follows:

*Charges for municipal water*

| City | Charge per thousand gallons | Charge per acre-foot |
|---|---|---|
| | *Cents* | |
| San Francisco | 61.8 | $201.37 |
| Chicago | 8.0 | 26.07 |
| Buffalo | 44.0 | 143.37 |
| Los Angeles | 44.0 | 143.37 |
| Washington | 36.5 | 118.93 |
| Baltimore | 26.7 | 87.00 |
| Boston | 26.7 | 87.00 |
| Philadelphia | 26.7 | 87.00 |
| Pittsburgh | 26.7 | 87.00 |
| Denver | 12.0 | 40.89 |
| Pueblo | 12.7 | [1] 41.50 |

[1] Project cost.

NOTE.—Consumption is based on filtered water delivered to conduits, no allowance being made for leakage in conduits, mains, or services.

I also present water costs in some large cities elsewhere.

(The information is as follows:)

*Estimated costs of municipal water on the projected Fryingpan-Arkansas project*

| Units | Water supplied (acre-feet) | Unit costs | | | | | | Total annual revenue |
|---|---|---|---|---|---|---|---|---|
| | | Supply system | Distribution system | | | Total per acre-foot | Total per 1,000 gallons | |
| | | | Pumping | Treatment | Delivery facilities | | | |
| | | | | | | | *Cents* | |
| Colorado Springs | 2,700 | [1] $26.80 | | | $12.25 | $39.05 | 12.0 | $105,430 |
| Pueblo: | | | | | | | | |
| Wurtz ditch | 2,000 | [2] 4.60 | [3] $4.95 | $11.40 | 2.55 | 23.50 | 7.2 | 47,000 |
| Present supply | 21,000 | [4] 3.60 | [3] 4.95 | 11.40 | 2.55 | 22.50 | 6.9 | 472,500 |
| Project water | 3,000 | 22.60 | [3] 4.95 | 11.40 | 2.55 | 41.50 | 12.7 | 124,500 |
| Valley towns: | | | | | | | | |
| Trunk line | 7,274 | 22.60 | 4.95 | 11.40 | 49.15 | 88.10 | 27.0 | 640,840 |
| Crowley branch line | 96 | 22.60 | 4.95 | 11.40 | 108.55 | 147.50 | 45.3 | 14,160 |
| Eads branch line | 170 | 22.60 | 4.95 | 11.40 | 216.95 | 255.90 | 78.5 | 43,500 |
| Colorado Fuel & Iron Corp | [4] 4,000 | [5] 2.00 | | | | 2.00 | | 8,000 |
| Water held for future demand | 1,260 | 22.60 | | | | 22.60 | 6.9 | 28,480 |
| Total | | | | | | | | 1,484,410 |

[1] System price for 3,200 acre-feet replaced chargeable to the 2,700 acre-feet actually delivered.
[2] Storage charge.
[3] Includes assumption of present pumping costs.
[4] Charge for improvement of quality of water.
[5] 10,000 acre-feet of storage space required for additional water to be acquired by the Colorado Fuel & Iron from the Arkansas River.

Senator ANDERSON. I assume you have gone into the present water supply system in Colorado Springs and know what they are now paying for their water; what the cost of their water now is and what the cost of this water would be?

Mr. POWELL. Yes; I have.

Senator ANDERSON. How does this water compare in cost with their present supply?

Mr. POWELL. It will compare very favorably, Senator. In addition, they will generate enough energy in their municipal electric plant to pay for this water.

Senator ANDERSON. What has that to do with it?

Mr. POWELL. It will be delivered to Colorado Springs at an elevation which will allow them to generate additional electricity.

Senator ANDERSON. Then all the power revenues are not turned in to the project?

Mr. POWELL. I complicated this unnecessarily. Colorado Springs gets their water by exchange. We pay back from the project to the Arkansas River, water which Colorado Springs would take from the south slope and high up on Pikes Peak to their present hydroelectric plants. The project would repay the water to the Arkansas River and to the water owners that water which Colorado Springs will divert from the slopes of Pikes Peak. It is a little complicated.

Senator ANDERSON. You would not blame me if I said that was a little difficult to follow; would you?

Mr. POWELL. No, sir. It is terribly difficult to follow. It appears time and time again in this project.

Senator MILLIKIN. Would it be simpler to say that this proposed project will supply Colorado Springs with water for its domestic consumption, which in turn it will utilize with other waters it has for the generation of power?

Mr. POWELL. I think that would answer it, Senator.

Senator CORDON. Why could it not use its water for generation of power, and then thereafter, below the power plant, use it for other purposes?

Senator MILLIKIN. That is the purpose. It will use it for consumption. It needs water for domestic consumption, but it will also use it for the generation of power. In other words, it will take the water to the foothills where the power is generated, we will give them that water. It will be on an exchange basis. That water will be used for the generation of power and for consumption. It serves a double purpose.

Am I right in that? Let me find out about that.

Governor AANDAHL. Am I correct, Mr. Powell, in saying that Colorado's source of municipal water now is limited by other water rights downstream?

Mr. POWELL. That is correct, sir.

Governor AANDAHL. And the water that Colorado Springs buys from the Bureau of Reclamation for municipal use will in reality be the water that goes downstream to the people down there who have water rights, and then in turn Colorado Springs can take more water from the source where it is now getting water and that will run through its powerplant.

Senator ANDERSON. I would say, looking at the picture of this, that no diverted water was going within many, many miles of Colorado Springs.

Mr. POWELL. You are correct, sir.

Senator ANDERSON. I did not get that from your explanation.

Senator MILLIKIN. Tell us, Mr. Powell, how Colorado Springs will get a part of this water for consumption, how it will get a part of it for power generation. Don't be worried about how complicated it is. I think we can understand it if you tell it to us.

Mr. POWELL. On the south slope of Pikes Peak, there are several small streams. Beaver Creek is the major stream. At an elevation of about 12,000 feet Colorado Springs takes a big part of that water through the mountain, north, through a tunnel, and drops this water, as I remember, about 4,000 feet down the north slope of Pikes Peak, through two generators, and then delivers it into the water mains of the city of Colorado Springs.

Now, by agreement with the water users further down Beaver Creek, which runs south——

Senator CORDON. Will you stop there. Maybe it will be helpful in your explanation, if I am correct in what I understand. The point of diversion for the water to Colorado Springs which flows down through a couple of generators and then into the mains, is above points of diversion on that particular stream where there are prior water rights which, by virtue of their priority, limit the amount of water that Colorado Springs can divert through its generators and into its mains?

Mr. POWELL. You are correct, Senator Cordon.

Senator CORDON. You seek now to supply to those persons holding prior water rights, other water from other sources so as to give them their full water rights, and thereby permit Colorado Springs to divert more water through its generators and into its mains?

Mr. POWELL. Well said; perfect.

Senator ANDERSON. Thank you. Now that is all right. Do you have in your Colorado State law the same requirement familiar to most of the Western States, that the uses shall be first for domestic purposes, and second for industrial purposes, and third for irrigation? So if it was an irrigation water right, it would be secondary to the municipal use.

Mr. POWELL. Could I call on this attorney here, who is so brilliant that he should talk anyway.

Would you answer that?

Mr. JEAN BREITENSTEIN (attorney, Water Conservation Board of Colorado). The Colorado constitution gives a preference to domestic uses over agricultural uses.

Senator ANDERSON. Therefore, it can take the water any time it wants to.

Mr. BREITENSTEIN. It can take it only by condemnation, Senator. Your preferences have nothing to do with priority. A greater preference can condemn a lesser preference, but it has to take the water in the order of priority.

Senator ANDERSON. Therefore, the city of Colorado Springs, any time it wishes to and needs this water for domestic purposes, could take it.

Mr. BREITENSTEIN. It could condemn it and have the value fixed by a commission or a jury. There are other complications in that, though, Senator. The change of an agricultural right to a domestic municipal right is complicated in Colorado, and all the aspects of it have not been determined by the Colorado Supreme Court as yet. There is at least one case before the court right now on that. It is not as simple as it sounds.

Senator CORDON. Would it be proper, then, to say that if Colorado Springs could condemn the lower-in-elevation rights, higher-in-time rights, for agricultural use downstream, it would, or course, have to pay the value of those rights.

Mr. BREITENSTEIN. Yes, sir.

Senator CORDON. It is the fact that it can get water under this scheme without having to pay that money that makes this valuable to Colorado Springs and permits it to pay into this plan rather than pay to the individuals whose rights it condemns?

Mr. BREITENSTEIN. That is correct, sir, yes.

Senator CORDON. The measure of its value would be whatever it cost to get the other water, assuming it could get it.

Mr. BREITENSTEIN. That is right.

Senator MILLIKIN. Colorado Springs, in doing that, would be drying up a part of the prosperity of its tributary area. I mean if it started out to condemn the waters to which the Senator is referring.

Senator ANDERSON. How much water, Mr. Powell, runs down the Fountain River at the point of Pueblo?

Mr. POWELL. About 40,000 acre-feet, Senator.

Senator ANDERSON. Is that now being utilized in irrigation?

Mr. POWELL. Yes, sir.

Senator ANDERSON. How much of that would Colorado Springs utilize?

Mr. POWELL. In this project, from Beaver Creek not Fountain Creek, 2,700 acre-feet.

Senator ANDERSON. There was some reference earlier to how much money it would acquire by generating power. There would be no additional power generated. The stream is now being utilized, is it not, for generation of power?

Mr. POWELL. It is in one plant. The project would have the responsibility of subordinating that plant and reimbursing the company for their rights. That is in this general arrangement.

Senator ANDERSON. I am sorry, you have lost me again.

Mr. POWELL. I was lost for 2 years on this project.

Senator ANDERSON. I did not ask you who owned what. There is a plant there now, is that not correct?

Mr. POWELL. There is a plant on the south side of Pikes Peak which belongs to the Southern Colorado Power Co.

Senator ANDERSON. Will that be dismantled?

Mr. POWELL. That will be dismantled.

Senator ANDERSON. I see. A new plant will be erected, then, as a part of this project?

Mr. POWELL. No, sir. There will not remain enough power water in the stream to make a plant feasible on this particular tributary.

Senator JACKSON. Who is going to compensate the power company?

Mr. POWELL. In the general arrangement, the city of Colorado Springs would pay for the subordination of the powerplant and the replacement of power.

Senator MILLIKIN. I can say to you, Senator Jackson, that the city of Colorado Springs does not make profligate agreements with private power companies. It has municipal power and knows how to handle itself very well.

Senator ANDERSON. Do I understand you are building another powerline up there, then?

Mr. POWELL. Senator, I am endeavoring to explain the Colorado Springs situation by itself. If you are referring to power generation on the entire project——

Senator ANDERSON. No, I am not. I am having difficulty enough with Colorado Springs for the moment. You started out by saying that water is taken from the south side and diverted through the mountain to the north side and then dropped down through generators and then comes to a plant on the north side. Where is this plant of Colorado Springs? On which side is that located?

Mr. POWELL. The plant of the city of Colorado Springs is on the north side. It presently exists. Through the plant on the north side the city of Colorado Springs drops approximately 4,000 acre-feet of water each year for the generation of energy. This additional water, coming from the south side through the present Colorado Springs plant and dropping down to Manitou, would generate additional energy through that same system without any enlargement or change, which belongs to Colorado Springs City.

On the south side of Pikes Peak there is a reservoir and a generating plant of, I think, 1,500 kilowatts, which will be subordinated and abandoned, and there will be compensation paid, in the arrangement, to the Southern Colorado Power Co. for the subordination of their rights.

Senator ANDERSON. What do they now supply with that 1,500 kilowatt plant?

Mr. POWELL. Senator, that goes into the Cripple Creek area. It is all in their network. I think in reality, it is used for peaking in heavy load periods of the day.

Senator ANDERSON. It seems like a minor point, but why would it be subordinated if it is working up there all right? Why do you want to get rid of it?

Mr. POWELL. We take a large part of the water away from it in this arrangement.

Senator MILLIKIN. Senator Anderson, may I read you what the report says about the Colorado Springs situation?

Senator ANDERSON. I would be happy for Senator Millikin to read it myself.

Senator MILLIKIN. This may clarify it. It is well to get back on the track:

A supplemental municipal supply for Colorado Springs would involve an exchange of irrigation water by means of project facilities. A pumping plant on upper Middle Beaver Creek would lift water to the city's system on Pikes Peak. En route to the city, the water would generate energy in two municipal powerplants, the output of which would exceed the loss in the Skaguay hydroelectric powerplant, on Middle Beaver Creek, owned by the Southern Colorado Power Co. Colorado Springs could reimburse the company for the lost power value. Replacement of the diverted water for irrigation use near Penrose would be accomplished by diverting water from Oil Creek to the existing Brush Hollow Reservoir. A diversion dam and a 15-mile supply canal would be necessary. Through a series of exchanges and coordinated operation of the Mount Pisgah Reservoir on Oil Creek and the Skaguay Reservoir, satisfactory replacement of irrigation water in the Arkansas Valley could be achieved.

Four thousand acre-feet of project water annually have been allotted to Colorado Springs for its immediate requirements. Of this 4,000 acre-feet, 2,700 acre-feet could be pumped into the city's system from Beaver Creek. Replacement of this 2,700 acre-feet for irrigation would require 3,200 acre-feet of project water due to transit and other losses. The remaining 800 acre-feet of project water represents reserve for replacement of possible diversions to the city from other tributaries of the Arkansas River.

That is what the report says about it. I think if we start to trace every drop of water through all the various exchanges that the report refers to, we will be working on the matter for a week.

Is not the end point that Colorado Springs is prepared to take water from this project, that it needs the water, that it will pay a reasonable price for it?

Mr. POWELL. That is correct, Senator.

(A brief summary of the effect of the project on the water supply of Colorado Springs was furnished for the record as follows:)

Estimates indicate that Colorado Springs will require approximately 5,231 acre-feet of additional municipal water by the year 2000. The development could provide only a portion of that supplemental supply. A total of 4,000 acre-feet of project water has been allocated to Colorado Springs. The plan provides for pumping 2,700 acre-feet of water into the city system from Middle Beaver Creek. That water would be replaced for irrigation use by project water. Because of transportation and other losses involved in the irrigation replacement, 3,200 acre-feet of replacement water would be required. The remaining 800 acre-feet of project water reserved for Colorado Springs could be utilized as similar replacement in the event of future diversions from upper Beaver Creek or from other drainages.

The municipal water would be lifted approximately 140 feet into the existing Colorado Springs municipal supply system beginning with reservoirs located on the south slope of Pikes Peak. The pumped water, regulated with the present supply, would generate energy in the two municipally owned hydroelectric powerplants of the Colorado Springs system.

The annual diversion of 2,700 acre-feet from the Beaver Creek watershed would reduce the water supply for the downstream Skaguay Reservoir, causing an annual loss of about 2,500,000 kilowatt-hours of energy from the Skaguay hydroelectric plant, both facilities owned and operated by the Southern Colorado Power Co. Estimates of the annual gain and loss in hydroelectric power production as a result of the diversion are as follows:

| | *Annual kilowatt-hours* |
|---|---|
| Gain at Ruxton and Manitou plants | 7, 500, 000 |
| Power required for pumping | —500, 000 |
| Loss at Skaguay plant | —2, 500, 000 |
| Net overall gain in production | 4, 500, 000 |

It appears that the net overall annual gain of 4,500,000 kilowatt-hours to the city of Colorado Springs would be sufficient either: (*a*) to finance the construction of a transmission line for the replacement of power lost at the Skaguay plant, or (*b*) if sold, would result in revenues sufficient for the city to reimburse the Southern Colorado Power Co. In either event, a transmission line to the pumping plant would be required. For the purpose of this study it has been assumed that the debits and credits involved in the power transaction would be about equal; therefore, neither the cost of the transmission line to the pumping plant nor its extension of the Skaguay plant has been included in arriving at the cost of the municipal water.

In addition to its hydroelectric use, water from Beaver Creek is also used by irrigators in the Penrose-Beaver area and in the Arkansas Valley. Coordination of the operation of Mount Pisgah Reservoir on Oil Creek is contemplated in the necessary exchange procedure for the replacement to the Penrose area. This plan for replacement involves the construction of a diversion dam on Oil Creek and a canal to the existing Brush Hollow Reservoir. A portion of the storage space in Skaguay Reservoir now used for power water regulation could be made available for irrigation supply for that part of the area not tributary to Brush Hollow Reservoir.

Senator ANDERSON. Then perhaps I could ask my question this way: The Bureau of the Budget found that the—

Plans for municipal water supplies appear doubtful because of high water rates, optimistic estimates, and uncertainty of including all proposed facilities and functions in the ultimate plans.

Would you comment on that statement by the Bureau of the Budget?

Senator CORDON. Would you begin by telling us whether Colorado Springs has agreed to this plan?

Mr. POWELL. The city of Colorado Springs has requested the association, which is represented by Mr. Ducy here, as president, to consider them in the amount of 4,000 acre-feet in the project.

Is that right, Mr. Ducy? You have a letter to that effect?

Senator MILLIKIN. Senator Cordon, page 25 of the report says:

In the event it is determined that said specific municipal water systems—

referring here to all of them—

are to be constructed by the Secretary of the Interior, a contract, providing among other things for payment to the United States of the actual cost of construction over a period of 40 years from the year in which the municipal water is first delivered with interest at the rate of 2 percent per annum and providing that operation, maintenance, and replacement of the works be assumed by the contracting party or parties, be a condition precedent to the start of construction of such works.

Proceed, Governor.

Senator ANDERSON. Is Colorado Springs the only place that has municipal water in this?

Mr. POWELL. No, sir. I will go on, if that is the desire.

Senator ANDERSON. I am willing he sould do it after Governor Aandahl finishes. Later on will be all right.

Senator MILLIKIN. Go ahead, Governor Aandahl.

Governor AANDAHL. There is just one further matter that I would like to call to the attention of the committee. The Public Service Company of Colorado and the Southern Colorado Power Co. are proposing to the committees of Congress that they will make their lines available, and where their lines are insufficient they will construct additional lines to take care of all of the wheeling power that will be generated in this project.

I want to say for the Department of the Interior that if the wheeling charges are satisfactory and there is indication that the service will be satisfactory, we look with favor on this type of arrangement.

Senator MILLIKIN. Does the Public Service Company of Colorado intend to respect the preference rights now established by law?

Governor AANDAHL. They will wheel power for the Bureau of Reclamation and deliver it to whatever customers the Bureau designates.

Senator MILLIKIN. The Bureau would respect the preference rights?

Governor AANDAHL. The Bureau would respect the preference clause.

Senator MILLIKIN. We do not have to decide. They are not asking for the inclusion of some provision of law at this time, are they?

Governor AANDAHL. It might be well to recognize this possibility in the authorization. I believe the bill authorizes the construction of transmission lines. It might be well to provide in the bill that transmission lines may be constructed by the Bureau of Reclamation if satisfactory wheeling arrangements cannot be worked out, or some language to that effect. I think it would be well to recognize this proposal in the authorizing legislation.

Senator MILLIKIN. It is not necessary to the project, is it?

Governor AANDAHL. The transmission of power is necessary to the project.

Senator MILLIKIN. Yes; I understand that, but to say now how it shall be transmitted is not necessary to the project, is it?

Governor AANDAHL. No.

Senator CORDON. You are going to have some contract in lieu of construction itself; is that right? If so, you would have to have authority for the alternative, would you not? In other words, if you have authority to construct transmission lines and you find that you get a wheeling contract which is of more interest to the Government, you would have to have authority to do that in lieu of the actual construction. For instance, you would not have as much money needed in appropriations because you would have a contract which you would pay on annually, according to the service that you got. Is that correct?

Governor AANDAHL. At the moment, I am not certain what the law provides there. It might be that there is general authority to enter into a wheeling contract, and I am just not certain about that.

Senator CORDON. If there is, that would satisfy it. If there is not, you should have the authority.

Governor AANDAHL. Yes.

Senator MILLIKIN. In point of time, when do you think the transmission lines will be built?

Governor AANDAHL. It would be several years. I could not speak with certainty as to the time.

Senator MILLIKIN. So there is time to work that out.

Governor AANDAHL. I believe it is expected that it will take probably 10 years before this project will be completed.

Senator MILLIKIN. The whole project?

Governor AANDAHL. Yes; all of the power.

Senator MILLIKIN. Proceed, Governor.

Governor AANDAHL. That is the information that I would like to leave with the committee. I do feel that it is a project that I can encourage the authorization of.

Senator MILLIKIN. Thank you very much.

Senator ANDERSON. Governor, there are two places in this report which have been referred to. I am referring now to page 25, where it says the payments will include interest at the rate of 2 percent. That is the paragraph G. Then in paragraph H, there is another provision for interest at the rate of 2 percent. In most of these we have been providing interest at the rate of what it actually cost the Government, and interest rates are going up.

Governor AANDAHL. I believe in the letter of April 30 to the President from the Secretary of the Interior, the interest rate is suggested at 2½ percent.

Senator ANDERSON. Even then, the more customary practice is to provide that it be the current rate of what it costs the Government. It might cost the Government 4 percent by that time.

Senator MILLIKIN. The average now, Senator Anderson, is about 2.6. So this is a little bit under the average, and the committee should consider whether it wants to go up to the average.

Governor AANDAHL. That would be fully satisfactory.

Senator ANDERSON. There are some of us who believe that sort of thing should not cost the Government anything where it is done for municipal water supply.

Senator MILLIKIN. Thank you very much, Governor.

We will recess until 2:30.

(Whereupon, at 12:30 p. m., a recess was taken until 2:30 p. m., of the same day.)

AFTER RECESS

Senator MILLIKIN. The meeting will come to order.

Mr. Beise, will you take the stand, please?

## STATEMENT OF CHARLES J. BEISE, ATTORNEY AT LAW, DENVER, COLO.

Mr. BEISE. Mr. Chairman, my name is Charles J. Beise. I am an attorney at law, a member of the law firm of Fairfield & Woods, with offices at 930 First National Bank, Denver, Colo.

Senator MILLIKIN. You are a mighty good lawyer, too.

Mr. BEISE. Thank you, Senator.

I was attorney for the Pine River Irrigation District and the Mancus Water Conservancy District which are two reclamation projects in southwestern Colorado.

For 4 years I served as assistant regional counsel for the Bureau of Reclamation, and since 1946 I have been attorney for the proponents of this project.

I have prepared and hand you, sir, a statement which I request be made a part of the record of the proceedings in this hearing.

Senator MILLIKIN. It will be made a part of the record in full.

(The statement referred to follows:)

STATEMENT CONCERNING THE PROPOSED FRYINGPAN-ARKANSAS PROJECT, LEGAL ASPECTS, SUBMITTED BY CHARLES J. BEISE, COUNSEL, WATER DEVELOPMENT ASSOCIATION OF SOUTHEASTERN COLORADO

My name is Charles J. Beise; I am an attorney at law engaged in private practice in Denver, Colo., a partner in the firm of Fairfield & Woods. I have practiced for approximately 20 years. During that time I have served as counsel for the Vallecito project and the Mancos project, both of which are in Colorado. I have been counsel for the Water Development Association of Southeastern Colorado since its organization.

I. PROJECT WATER SUPPLY

By the terms of the Colorado River compact there has been allocated to the upper basin States a consumptive use of 7,500,000 acre-feet of water, subject to the provisions and conditions of that compact. By the terms of the upper Colorado River Basin compact of October 11, 1948, Colorado has been apportioned the consumptive use of 51.75 percent of the water available for use in the upper basin after deducting the 50,000 acre-feet annually to which Arizona is entitled. Colorado's apportionment is therefore estimated to be approximately 3,855,000 acre-feet annually. Exclusive of the Fryingpan-Arkansas project, and considering all projects presently constructed or authorized and all water consumption by private irrigation at the present time, it is estimated that Colorado uses approximately 1,590,000 acre-feet. In other words, there is available for future irrigation requirements in Colorado 2,265,000 acre-feet. It has been estimated that of this amount approximately 440,000 acre-feet should be reserved to meet Colorado's share of depletions on main-stem reservoirs for longtime holdover storage on the Colorado River, to make the water available for the upper basin under the Colorado River compact.

Accordingly, approximately 1,825,000 acre-feet annually will remain for future use in Colorado. Thus the Fryingpan-Arkansas project diversion of approximately 70,000 acre-feet would require and use less than one twenty-fifth of the estimated water available for future requirements of the State of Colorado. In other words, after the requirements of the Fryingpan-Arkansas project have been satisfied, there will still be available approximately 1,750,000 acre-feet of water annually to meet other potential uses of Colorado River water in Colorado.

As far as the interests of other States are concerned, attention is directed to the operating principles to be hereafter discussed, which are the result of over 2 years' negotiations between water interests in western Colorado, that is, water users west of the Continental Divide and within the State of Colorado, and water users on what is known as the Eastern Slope of the State of Colorado. It is safe to state that no other project in Colorado has ever been studied as thoroughly as has the Fryingpan-Arkansas project. Greater precautions have been taken for the benefit of the Western Slope of Colorado and, indirectly and ultimately, for the interests of the other States of the Colorado River Basin in connection with this project than any other project ever devised.

Eastern Colorado, where the project waters will be consumed will become a part of the Colorado River Basin under article II (b) of the Colorado River compact.

The benefits from the project are not limited to the importation of Colorado River water alone, but the project contemplates additional benefits derived through the reregulation of the waters of the Arkansas River. In connection with this proposed saving, the terms of the Arkansas River compact between Kansas and Colorado entered into on December 14, 1948, must be considered. The compact made specific provision for the proposed Fryingpan-Arkansas project by including therein the terms of article 4–d which reads as follows:

"This compact is not intended to impede or prevent future beneficial development of the Arkansas River Basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoirs, and other works for the purposes of water utilization and control as well as the improved or prolonged functioning of existing works; provided that the waters of the Arkansas River, as defined in article 3, shall not be materially depleted in usable quantity or availability for use to the

water users in Colorado and Kansas under this compact by such future development or construction."

No material depletion in usable quantity or availability for use to the water users in either State is contemplated by reason of the anticipated benefits. Attention is directed to the comments of the State of Colorado, paragraph 6 thereof, which provides as follows:

6. Colorado calls attention to the fact that the project, its operation, maintenance and the use of Colorado River water thereunder, must be subject to the provisions of the Colorado River compact of November 24, 1922 (H. Doc. 605, 67th Cong., 4th sess.), the upper Colorado River Basin compact of October 11, 1948 (Public Law 37, 81st Cong., 1st sess.), and the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057–1064). Further reference to this matter appears in these comments in connection with the subject of operating principles. The features of the project and their operation for the storage and re-regulation of the native waters of the Arkansas River are subject to the provisions of the Arkansas River compact of December 14, 1948 (Public Law 82, 81st Cong., 1st sess.) between Colorado and Kansas. On July 24, 1951, the Arkansas River Compact Administration, an agency created by the compact for its administration, after a review of the project report and consideration of the effect of the operation of the proposed project on the administration of the provisions of the compact, adopted the following resolution:

"Whereas there has been submitted to the States of Colorado and Kansas by the Secretary of the Interior, in accordance with provisions of section 1 of the 1944 Flood Control Act, a report of the Bureau of Reclamation on the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado (project planning report No. 7–8a.49–1) and such States are required to transmit to the Secretary of the Interior their respective official comments and recommendations on the report and proposed development; and

"Whereas the Arkansas River Compact Administration, an official interstate body created by the Arkansas River compact and charged with the administration of such compact, is interested in the proposed development to the extent that its construction and operation shall not interfere with the rights, interests, and obligations of Colorado and Kansas under the compact: Now be it

"*Resolved by the Arkansas River Compact Administration*, That the following comments and recommendations relating to said report of the Secretary of Interior, to wit:

"The Arkansas River Compact Administration submits these comments and recommendations to the Governors of Colorado and Kansas respecting the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, namely:

"1. The administration understands that the project plan proposes:

"(*a*) The importation by appropriate project works of approximately 70,000 acre-feet of water a year from the Colorado River Basin to the Arkansas River Basin for supplemental irrigation and domestic water supplies in Colorado and for the production of hydroelectric energy.

"(*b*) In connection with such importation of water and its regulation in the Arkansas River Valley by project works, the reregulation of native waters of the Arkansas River (the term 'native waters,' as herein used, being those waters covered and defined by art. III–B of the Arkansas River compact).

"2. The interstate water relations of Colorado and Kansas with respect to the Arkansas River do not justify any objection to the proposed project development for the importation of Colorado River water (described in subparagraph (*a*) above).

"3. The reregulation of native waters of the Arkansas River (native waters being as above mentioned) concerns the Arkansas River Compact Administration and both Colorado and Kansas in complying with the provisions of the Arkansas River compact and maintaining the benefits and obligations of the two States under that compact. To that end, it is recommended to the Governors of Colorado and Kansas, and expressed as a policy of the Arkansas River Compact Administration, that the initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, as set forth in project planning report No. 7–8a.49–1 of the Bureau of Reclamation, be approved; provided, however, that there shall be no reregulation of native waters of the Arkansas River as proposed in such report until a plan of operation, rules, regulations, procedures, and agreements in furtherance thereof, including any pertinent agreements between the Corps of Engineers

and the Bureau of Reclamation, shall have been submitted to, and approved by, the Arkansas River Compact Administration and the affected water users.

"4. It is the purpose and intent of these recommendations that the proposed project development shall not interfere with or defeat the rights, interests and obligations of Colorado and Kansas under the Arkansas River compact.

"be transmitted to the Governors of the States of Colorado and Kansas and such Governors be and are hereby requested to submit the same to the Secretary of the Interior with their official State comments and recommendations upon said proposed project and development."

Colorado interprets and understands that paragraph 3 of the resolution of the Arkansas River compact administration is controlled by paragraph 4 thereof; and that the words "affected water users" in said paragraph 3 mean only water users in the State of Colorado so long as Colorado complies with terms of said compact.

Of the estimated approximately 185,000 acre-feet to be made available as supplemental irrigation water at canal headgates in the Arkansas Valley through the facilities of the Fryingpan-Arkansas project, the diversion of 69,200 acre-feet of water from the Colorado River will produce a net headgate supply of an estimated 53,700 acre-feet. The remaining 132,000 acre-feet to be made available by the project will come as a result of capturing Arkansas River floods, return flows from increased municipal supplies, and savings from better utilization methods including those resulting from the abolition of direct winter diversions and converting them into storage rights to be utilized during the summer irrigation season. At the present time there is diverted directly to the lands during the winter months approximately 160,000 acre-feet of water in Colorado. Of this 160,000 acre-feet it is estimated that 93,000 acre-feet can be converted into storage, or a net production as a result of this saving after losses chargeable thereto of some 74,000 acre-feet of water. In addition, it is currently estimated that 50,000 acre-feet of water are lost annually as a result of reservoir evaporation, mostly from private reservoirs at low elevations in the plains area. By moving this storage upstream to deep project reservoirs, this evaporation loss can be substantially reduced. The estimated 185,000 acre-feet to be made available by reason of the construction of this project does not include such possible evaporation savings. At the present time there is an estimated average annual headgate shortage for irrigation requirements of presently irrigated lands of 340,000 acre-feet. If the project is constructed it will reduce this shortage to approximately 155,000 acre-feet, or a reduction from 35 percent shortage of ideal requirements to approximately 16 percent shortage.

In other words, there is and will be at all times a greater demand for water than that which can be made available by this project. The proposed reregulation of winter flows will entail the execution of contracts with the affected water users. Most of the water users of the valley in Colorado have been contacted. Without exception, all have indicated a general interest in the possibilities of water savings through reregulation of winter water use. The same is true of possible evaporation savings. Neither plan would interfere with any of the water rights of the State of Kansas.

All that is required to perfect the acquisition of water rights for the project is to make a water filing pursuant to the terms of the laws of Colorado and as provided by section 8 of the reclamation law of 1902. As soon as the project has been authorized, the project proponents will make a filing with the State engineer of the State of Colorado for all of the waters required for the project, both on the Colorado and Arkansas Rivers. Thereafter, as promptly as possible, a conditional decree will be procured adjudicating and establishing the rights of the project to this water. The foregoing statement with reference to project water supplies and the acquisition of title thereto is limited to the eastern slope works. Insofar as the rights to store water in Aspen Reservoir are concerned, as provided in the operating agreement, they shall be acquired under the laws of the State of Colorado, but title thereto shall be initiated and acquired by and held in the name of the United States.

### II. AUTHORIZATION AND OPERATION OF FRYINGPAN-ARKANSAS PROJECT

Senate bill No. 964 authorizes the construction and operation of the project, in accordance with the plans set forth in Senate Document No. 106, 82d Congress, 2d session, and in accordance with recommendations E to K set forth on pages 25

and 26 of that document, which we will hereafter discuss as the operating principles. The bill preserves all of the provisions of Senate Document No. 80, 75th Congress, 1st session, for the benefit and rights of western Colorado water users in and to Green Mountain Reservoir of the Colorado-Big Thompson project (sec. 3). As the committee will recall, the Colorado-Big Thompson project contained as one of its essential features a compensatory reservoir for the benefit of western Colorado water users known as the Green Mountain Reservoir located on the Blue River above the town of Kremmling, Colo. Because of various conflicting contentions as to the interpretation of that document, it was felt that if the bill authorizing the Fryingpan-Arkansas project made no reference to Senate Document No. 80, it could be argued indirectly that Congress had subsequently adopted the point of view of one side or the other as to the interpretation thereof. To prevent such possible contention and to assure the citizens of western Colorado that their rights remained intact under Senate Document No. 80, section 3 of the bill was inserted.

Section 4 of the bill was made necessary by the language contained in section 12 of the operating principles hereinafter discussed. Suffice it to say at this point that the municipal requirements of Colorado Springs and Pueblo, as well as the other valley towns were admitted by all parties involved. Inasmuch as some 15,000 acre-feet of project water have been tentatively allocated for such municipal requirements, which tentative allocation was used in a large part as justification for constructing the project insofar as negotiations intrastate in Colorado were concerned, the western slope interests desire to have language inserted in the operating principles to the effect that domestic purposes would be preferred over all others. This provision possibly is inconsistent with other provisions of the reclamation laws, which prefer irrigation. Accordingly, in order to carry out the terms of the operating principles, it was necessary to specify that domestic use be preferred. This is satisfactory to the water users in both eastern and western Colorado and is considered by the project proponents to be an intrastate matter limited to a minor phase of the project.

Section 2 of Senate bill 964 was made necessary by reason of the creation of a commission to administer the operating principles, and it specifically authorizes the Secretary of the Interior to appoint the two representatives of the United States to the Commission. The Secretary is further authorized to agree to modifications of the operating principles recommended by the Commission, provided, of course, that the recommendations are not inconsistent with the principles themselves. As there is no provision in Federal law for the appointment of such Commissioners, it was necessary to add section 2 to the authorizing legislation.

Section 1 of Senate bill 964 simply authorizes the construction of the project, subject to the limitations of the various international and interstate water compacts. The operation is to be consistent with recommendations E to K, both inclusive, of the regional director. These recommendations provide that the project will be operated in accordance with the operating principles; that before any municipal water supply system is constructed it will be necessary for the communities involved to prove their inability to construct or to finance the construction themselves, either singularly or jointly, and then before any such construction can be undertaken, a contract must be executed whereby the municipalities are bound to repay the costs thereof within 40 years, as well as interest thereon at the rate of 2 percent per annum, and to assume all operation, maintenance, and replacement costs of the works during the interim. Sections H and I of these recommendations authorize the Secretary of the Interior to establish rates for the sale of municipal, industrial, and irrigation water supplies and make possible flexible contracts, both as to their duration and the rates of charge therefor. Flexible provisions were requested by the proponents of the project because of the inflexibility of the ordinary irrigation project repayment contract. An analysis of such contracts indicates that frequent amendments are necessary by reason of the change of project plans, economic conditions or repayment ability of the users. Under Colorado law repayment contracts must be approved by the water users and confirmed by court decrees.

This provides a most inflexible arrangement. It has been necessary in connection with projects in other States for the Secretary of the Interior to seek authorizing legislation from Congress enabling him to enter into amendatory contracts. This is very costly, inflexible, and unsatisfactory from the point of view of both the Federal Government and the water users of the States. As a result of this experience, project proponents have requested the act to contain legislation which would make the duration of the contracts and all other provisions

thereof subject to constant negotiation. It is believed that at the outset water allotments will be made for relatively short intervals of time, possibly 1 or 2 years' duration. This is believed possible and desirable because the demand for water will so far exceed the supply that there will be a certain market at all times. Furthermore, should there be a surplus in any one or series of years, it would be accumulated by the project in the upper storage reservoirs and available there for the production of electric energy which is a most desirable feature of the project operations. All other provisions in sections J to N, both inclusive, are self-explanatory.

An analysis of the operating principles is next in order. Section 1 of the operating principles simply contains a definition of terms. Section 2 provides for the construction of Aspen Reservoir with a capacity of 28,000 acre-feet near the town of Aspen, Colo. Section 3 makes the cost of construction and operation of that reservoir a charge against the project. Section 4 states that the same must be completed before any water is diverted to eastern Colorado by means of the project. This assures the western slope interests in Colorado that the reservoir will be constructed as a part of the project and will be built before any waters are taken out of the basin. Sections 5, 6, and 7 relate to the method of water releases from Aspen Reservoir. Section 5 incorporates the provisions of the laws of Colorado for the protection of in-basin users and provides that the project will be operated just as though it had been constructed by a water conservancy district organized under the State laws. Water conservancy districts will be hereafter discussed.

In the main, it is simply a form of entity, originally peculiar to Colorado and now adopted by several other States, which has replaced the common concept of an irrigation district. Section 6 makes the first responsibility and obligation of Aspen Reservoir to replace waters to western Colorado by reason of any losses from stream depletions caused by the operation of the project. All present uses are protected and all future uses except power generation, and they are specifically enumerated—required winter flows, as well as industrial demands of 300,000 acre-feet, which is the estimated amount of water which might possibly be required in connection with the development of oil shale in the vicinity of Rifle, Colo. Whenever any of these specified users are short of water they may request the State engineer of Colorado to make a release. This request is then conveyed to the United States, and the required water must then be released without charge. Section 7 deals with that portion of Aspen Reservoir which is not required for replacement capacity. In other words, there may be times when the reservoir will have water in excess of that which is required for full replacement needs as defined in sections 5 and 6. This surplus water may be sold to western slope water users in Colorado. Any charge therefor shall be comparable to that assessed against project interests in eastern Colorado with appropriate adjustment for repayment ability. The last sentence thereof has to do with the resultant increase in cost of supplemental supplies made necessary by the construction of the project. In other words, if a western slope water user is required to construct some irrigation feature which he would not have been required to build if the project had not been built, the difference in cost to him of such acquisition shall be considered in establishing rates for the sale of surplus water from Aspen Reservoir to such user.

Because of possible demands on Lime Creek it was agreed that diversions therefrom would be restricted to the months of high runoff, that is, May and June of each year.

In order to protect recreational and fishing values on the western slope where the tourist industry is a major one, and because of the experience encountered on other projects in the West, from the very inception of project planning the Game and Fish Department of the State of Colorado, as well as the Fish and Wildlife Service of the United States Government, have been constantly contacted and consulted concerning this project. As a result of those negotiations and discussions, sections 9 and 10 have been inserted in the Operating Principles. Section 9 is limited to the Fryingpan collection system, and the minimum flows therein specified are those which the recreational interests of the State and Federal Government consider to be adequate for the protection of fishing values. Two points of control have been designated, that is, the points of diversion collectively of the project and the junction of the North Fork and Fryingpan near Norrie. The flow specified cannot be less than the minimums set forth at either point.

In 1938 the Twin Lakes Reservoir & Canal Co., a private enterprise, completed a transmountain diversion project whereby waters were diverted from the

Roaring Fork River and made available for use on lands in the Arkansas Valley. This private project obtained a water right as provided by the laws of the State of Colorado. Project demands if superimposed on Twin Lakes demands could result in damage to fishing and recreational values. Section 10 makes possible an exchange so that the Twin Lakes Reservoir & Canal Co. may obtain a like quantity of water from other sources without expense to it. This is accomplished by the extension of a canal on Hunter Creek and is a prior demand on the project to the extent of 3,000 acre-feet annually. The minimum streamflows specified in section 10 were established by the United States Fish and Wildlife Service and the Colorado Game and Fish Commission.

The Twin Lakes Reservoir & Canal Co. has been contacted and has agreed in principal to the proposed exchange on the assumption, of course, that their water rights will not be impaired, nor will there be any charge imposed upon them by effecting such exchange. In other words, they are voluntarily relinquishing their natural flow rights to divert water, provided the project makes available a substitute source of a like amount without charge. However, section 10 does provide that if the Twin Lakes Reservoir & Canal Co. derives additional water or other advantages that it could not have realized had the project not been constructed, the operating principles shall not prevent the project from making an appropriate charge for such benefit or advantage.

Section 11 was inserted at the request of western Colorado citizens and the Colorado Game and Fish Department. The experience in connection with the Colorado-Big Thompson project, especially Shadow Mountain Lake, has indicated the vast amount of recreational demand made upon project areas. It is reasonble to anticipate a like demand in connection with Aspen Reservoir and possibly the enlargement of Twin Lake Reservoir on the eastern slope. Accordingly, it was felt desirable to preserve these features for the benefit of the public except as to strategic areas, the reservation of which is deemed administratively to be essential for operating purposes.

Sections 12 and 14 have already been discussed. Section 13 of the operating principles was requested by western slope water users by reason of the terms of the Colorado River compact and because of their interests in seeing that the greatest possible benefit was derived by water users in the Arkansas Valley by the importation of Colorado River waters.

Section 15 makes the project subject to the various compacts and acts therein designated. In addition, it establishes the priority of Aspen Reservoir over other features of the project required for eastern slope diversions. This is, however, limited to the capacity of Aspen Reservoir. In other words, although all tabulations made indicated that the situation therein contemplated would never arise and, from a practical standpoint, the problem is academic, nevertheless, for the protection of western Colorado water users, it was agreed that if any curtailment of Colorado River water users is required in the State of Colorado by the terms of the Colorado River compact or the upper Colorado River Basin compact, eastern slope water users shall be curtailed up to the capacity of Aspen Reservoir before there is any curtailment of the storage right in Aspen Reservoir.

Section 16 requires the water rights for Aspen Reservoir to be initiated and perfected in the name of the United States as has been heretofore pointed out. Likewise, as far as the eastern slope project works are concerned, it is optional for the Secretary to obtain or to require the transfer to the United States of any water rights initiated or acquired, that is, project proponents could file on the water rights for the eastern slope project features and obtain a decree thereto. That decree when obtained could, on demand of the Secretary of the Interior, be transferred to the United States for the project. There is expressly excepted from this provision, however, vested rights to present appropriations.

Section 17 establishes a commission composed of 5 men, 1 representing eastern Colorado, 1 representing western Colorado, 2 representing the United States, and 1 representing the State of Colorado at large. This is a most important provision and provides a tribunal before which the operating principles as applied to changing conditions can be presented for discussion and recommendations.

### III. CORPORATE ENTITY FORM TO OPERATE DISTRICT AND TO REPAY PROJECT COST

Prior to the authorization of the Colorado-Big Thompson project, all reclamation irrigation projects in Colorado had been financed by water users organizing either as irrigation districts or as water users' associations. There were two irrigation district laws, one passed in 1905 and the latter in 1921. When the Colorado-Big Thompson project was conceived, a reappraisal of the State legis-

lation was made. As a result, a tailormade corporation was devised, based in part on the Golden Gate district in California, the Metropolitan Water District Act of Utah and of California, and other corporate acts of Colorado such as the Conservancy Act, the Moffat Tunnel Improvement District, and the old irrigation district laws. The result is known as the Colorado Water Conservancy District Act of 1937. This act provided for the formation of quasi-public corporations. There have been thus far some seven conservancy districts organized in connection with different reclamation projects in Colorado, the largest of which is the Colorado-Big Thompson project and the smallest of which is the Mancos project. In the Frying Pan-Arkansas project the proponents propose to organize a water conservancy district covering all or parts of some 12 counties and reaching from the Continental Divide in Lake County at Leadville, Colo., to the Kansas-Colorado line. In general, the exterior boundaries of the area included within the district would be those lands presently irrigated and which could receive indirect or direct benefits from the project without requiring new facilities to serve such lands. Inasmuch as no excess water will be produced by the project, there will be no effort to include raw or unimproved arable lands. The district when organized will have a board of directors and the power to administer its own affairs.

Such districts have perpetual existence, are authorized to acquire water and water rights and real and personal property, to exercise the power of eminent domain and dominant eminent domain, to contract with the Government of the United States or any agency thereof for the construction, operation, and maintenance of all forms of irrigation works, to establish rates at which water may be sold, leased, or otherwise disposed of, to employ adequate personnel, and, in general, to perform each and everything one ordinarily associates with irrigation districts. One of the unique provisions of this type of district is the power to levy a general tax upon all property within the district, whether or not the particular property involved acquires any water from the project. The limit of such taxation is, however, a maximum of not to exceed 1½ mills as follows—prior to the date water is ready for delivery from the project works, not to exceed one-half mill, and thereafter not to exceed 1 mill on each dollar of assessed valuation of such property in the district except in the event of a default or deficiency, whereupon an additional levy not in excess of an additional one-half mill may be imposed on a total assessed valuation of $132 million (the estimated assessed valuation of all property within the boundaries of the district). A 1 mill levy would produce an estimated annual net revenue of $119,000 (1 mill minus 10 percent), which sum would be available to help repay that portion of the project assessed against irrigation features.

Any irrigation district located within the boundaries of the water conservancy district or any individual owners of land may petition the board of directors of the district for an allotment of water. The board has the power to grant or refuse such petitions after a public hearing in connection therewith. If such petition is granted, there is no limit to the financial obligation of the land receiving water, but the principle of law known in irrigation legal circles as the "last fertile acre" is the limit of liability as pointed out in the project report. It is estimated that there will be a net headgate water supply available of approximately 56,700 acre-feet for which a charge of $3.60 per acre-foot can be levied. In addition, the Twin Lakes Reservoir and Canal Co., which presently has more water rights than it has space to impound the same on the eastern slope of Colorado, could purchase storage space from the project. It is anticipated that 12,500 acre-feet of such storage space would be available at a charge of $2 per acre-foot per annum. All of this is more particularly stated in the regional director's letter at page 18 of said Senate document. In addition, the board of directors of a water conservancy district can receive petitions from the various municipalities desiring to purchase water. In these petitions each municipality agrees to make payments in accordance with the schedule affixed to that petition and approved by the board. If the petition is approved by the board of directors, the county officers of the county in which such cities are situated levy such taxes as may be required upon all lands within the boundaries of the city in order to meet the municipal payments. On failure to pay any water assessment, real property can be sold at any regular tax sale in the same manner as provided by the statutes of Colorado for failure to pay general property taxes. Section 25 of chapter 266 of the Session Laws of 1937 also authorizes the sale of water by contract, lease, or otherwise, by the conservancy district.

Thus, the administration of the water supply would be in the hands of the district, and the provisions of the State statutes with reference to this subject

are sufficiently flexible and complete to enable efficient administration of such supplementary water supply, either for irrigation or for municipal purposes. Furthermore, the district has adequate powers to enter into any and all contracts that may be required for reregulation of winter water or to effect savings of evaporation from shallow-plain reservoirs by the owners thereof storing their water upstream in reservoirs at greater altitudes where evaporation is decidedly less and where the project reservoirs offer a greatly reduced surface area to the effect of evaporation. In passing it should be noted that no city with a population in excess of 25,000, according to the last census, shall be included within the boundaries of the district unless by and with the written consent of the chief executive officer of such city or city and county and with the approval of the legislative body of said city. Such consent may specify that the rate of taxation on the assessed valuation of property within such city shall not exceed a maximum rate, which may be less than the rates set out in the statute as applicable to property outside the boundaries of a city (the 1½-mill levy hereinbefore referred to). Section 32 of the Water Conservancy Act requires a contract with the United States to be submitted to qualified electors of the district, herein defined as electors who have paid a tax on property in the district in the year preceding such election, at the time and place of the election. Each such elector has the privilege of voting in favor of or opposing the proposed repayment contract.

In the event that a majority of the qualified electors of the district have voted in favor of the proposition submitted, the district is authorized by law to enter into such a contract and to incur any obligations thereof. Finally, it is the usual procedure in cases of this type to bring a confirmation proceeding in a court of competent jurisdiction, as provided in section 36 of the Water Conservancy District Act, to obtain a court decree approving the creation of the district and the execution of the repayment contract with the United States.

Some minor amendments have been made since 1937 which enhance the flexibility of this type of district. In 1938, in the *People of the State of Colorado* v. *Letford, et al.* (102 Colorado 284, 79 Pacific 2d 274), the Supreme Court of the State of Colorado upheld the constitutionality of the water conservancy district law in a proceeding brought to challenge it.

Some of the legal problems in connection with municipal water are deserving of special attention. Colorado Springs, Pueblo, and the valley towns of Manzanola, Rocky Ford, La Junta, Las Animas, Lamar, Crowley, Wiley, and Eads have all requested allocations of municipal water, and a total of 15,000 acre-feet of project water have tentatively been reserved for such annual demand. Colorado Springs, being on the Fountain River and having a source of water other than the Arkansas River, poses a problem peculiar to itself. The requirements of Colorado Springs would be solved by the exchange of water by means of pumping and special project works designed to serve only Colorado Springs. These costs are comprised of the cost of a pumping plant, penstock, substation, power for pumping, construction costs of diversion dam on Oil Creek, canal and operation and maintenance expenses, as well as the purchase of Fryingpan-Arkansas water to be exchanged for waters taken by the city of Colorado Springs. All other cities have a common problem from Pueblo east and down the Arkansas Valley

For these cities a charge for project water would be made, and the pro rata cost of the pipeline, pumping, and treatment plant to serve such city or town would be added thereto. In accordance with the recommendations of the regional director, paragraph F, page 25, Senate Document 106, 82d Congress, 2d session, provides that no portion of such municipal water supply systems as are described in the report be constructed until or after satisfactory evidence is presented to the Secretary of the Interior that it is not feasible for the communities involved to construct or to finance the construction of such work themselves. Paragraphs G and H thereof require the repayment of the costs plus interest at 2 percent with 40 years, plus operation, maintenance, and replacement costs, and they further authorize the Secretary to establish rates at the lowest price consistent with sound business principles but in no case higher than the cost of an alternative single purpose supply of equal quantity and quality. While the costs indicated might appear to be prohibitive, the quality and quantity of water available to the cities of the Arkansas Valley is such that it is worth whatever the charge may be for these municipalities to procure additional water supplies. In line with the recommendations herein referred to, the cities would be called upon to finance their own works, but if that is not possible, the Secretary of the Interior may construct such pipeline, pumping, and treatment plant as a part of the project, provided, however, that contracts are first entered into with the various municipalities involved to assure the United States the recovery of the costs thereof. Such

contracts are to be several or joint and several, or it is possible that under Colorado law a district could be formed, comprising only the municipalities from Pueblo east purchasing water, and those municipalities could contract with the master water conservancy district for the repayment of the costs thereof. It is contemplated throughout that the water conservancy district to be organized will have administration and control over all of the waters, both domestic and irrigation, and there will not be two corporate entities engaged in the same field.

The foregoing comprises the principal legal aspects of the Fryingpan-Arkansas project. There are many other legal problems which will arise, but time prevents a discussion of them, and it is believed that ample precedents exist under the Federal reclamation laws and the laws of Colorado to cope with any and all such problems.

Mr. BEISE. Rather than comment on my prepared statement and in order to render the maximum possible assistance to this committee, it is my function to do three things: First, to present a very brief summary of the Fryingpan-Arkansas project; second, to identify the witnesses who will follow me and designate the general subject matter of their testimony so that the pertinent questions concerning thereto can be submitted to them; and last, to briefly comment on the Bureau of the Budget report.

The sponsors of the Fryingpan-Arkansas project are united in a nonprofit corporation known as the Water Development Association of Southeastern Colorado, which represents all water users in the Arkansas Valley from the town of Leadville, Colo., to the Kansas State line, a distance of approximately 360 miles.

The proposed project is a multiple purpose reclamation project designed to provide irrigation and domestic water, electric power, and flood control for the portion of the Arkansas Valley in the State of Colorado. The flow of the Arkansas River at Pueblo has an annual variation from approximately 200,000 acre-feet minimum to a flow in excess of 1 million acre-feet. This extreme variation results in a desperate need for supplemental irrigation water, reregulation, as well as flood control.

The project proposes to capture and divert approximately 70,000 acre-feet of water annually from the western slope of Colorado by means of ditches and to transport the same by tunnel to eastern Colorado, where this water will be stored in reservoirs and subsequently released to provide irrigation and domestic water and for the generation of electric energy. The same reservoirs will capture intermittent flood flows of the Arkansas River and will make possible the reregulation of such Arkansas River waters.

Reregulation will consist of ceasing the present practice of using water during the winter months and in lieu thereof the same will be stored in reservoirs for release during the growing seasons.

Senator MILLIKIN. Explain that winter use of water to us, will you, Mr. Beise.

Mr. BEISE. Senator, at the present time and for years past, farmers, knowing of the threatened shortage of the coming growing season, have endeavored to make reservoirs out of their land.

Senator MILLIKIN. They stock the lands?

Mr. BEISE. They stock the lands.

Senator MILLIKIN. With the water that they are entitled to?

Mr. BEISE. That is not obtaining the maximum possible beneficial use of the water.

Likewise, shallow plains reservoirs having extremely high evaporation losses will be used to a lesser extent and in lieu thereof waters

previously stored therein will be stored in project reservoirs with lower evaporation losses.

Senator MILLIKIN. Obviously, evaporation operates on the surface, and there will be more evaporation to a given amount of water with a wide surface than with a narrow or small surface?

Mr. BEISE. That is correct, sir. The magnitude of the problem can be illustrated by the fact that there is a 50 percent loss of water stored in Meredith Reservoir. The same acre-feet of water stored at Sugar Loaf or Twin Lakes or even at Pueblo Reservoir would result in a much, much less loss by evaporation.

Senator MILLIKIN. If you spread a lot of water out over this whole room, say, and subjected it to evaporation, there would be a whole lot more evaporation than the same amount of water stored in a well, because only the surface is subject to evaporation, is that not correct?

Mr. BEISE. That is correct.

Senator MILLIKIN. Thank you.

Mr. BEISE. The project will, in effect, make available for beneficial use in the Arkansas watershed a total of approximately 183,000 acre-feet of new water per annum of which approximately 70,000 acre-feet of water originates in western Colorado.

Senator MILLIKIN. The difference between the 70 and the 183 comes about largely through reuse and reregulation of that 70,000 acre-feet of new water, is that correct?

Mr. BIESE. Partially correct. In addition, Senator, there would be spasmodic flood flows captured. There would be reregulation in Arkansas River water as well as western slope water, and the total combined result is a new supply of 183,000 acre-feet.

Senator MILLIKIN. Thank you very much.

Mr. BEISE. Physically, the project consists of ditches, tunnels, canals, dams, powerplants, and domestic water pipeline and treatment plant. The project's cost under today's prices is approximately $173 million, which will be charged to the following facilities——

Senator MILLIKIN. Mr. Beise, will someone a little later on give us some of the detail on the treatment plant?

Mr. BEISE. Yes, sir. The project engineer is the most capable man of doing that, Mr. Ben Powell.

$75 million to irrigation; $42 million to power facilities; $32 million to municipal water facilities; $20 million to flood control; and less than $3 million to fish and wildlife.

Senator MILLIKIN. May I intervene with this question?

Mr. BEISE. Indeed.

Senator MILLIKIN. Will some witness to come later give us some idea of the care that has been taken in estimating the cost?

Mr. BEISE. Mr. Royce Tipton has made an independent analysis of the unit costs involved. He and the project engineer both can testify as to that.

Senator MILLIKIN. And they will testify?

Mr. BEISE. They will testify to that.

Senator MILLIKIN. Thank you very much, because we should not blink the fact that there have been many charges that the cost estimates of the Bureau of Reclamation at times have been somewhat on the optomistic side. I am glad to hear that you are prepared to have something to say on that subject.

Mr. BEISE. Thank you, sir.

The entire project water production will be consumed as a supplemental supply for the irrigation of approximately 320,000 acres of presently irrigated lands, which purpose will require approximately 168,000 acre-feet. Municipal water supplies for valley towns will require the remaining 15,000 acre-feet, which is 8 percent of the total.

The charges for irrigation water will average $5.40 per acre-foot and the project will make available approximately one-half acre-foot of water to each acre of presently irrigated land.

Two dirt farmer witnesses will testify that the proposed charge for irrigation water is well within the ability of the users to repay.

Senator MILLIKIN. Will someone testify as to the organization out there of water districts and give us that kind of information?

Mr. BEISE. They will, indeed, sir. Either Mr. Jean Breitenstein or myself can answer, I believe, any questions as to the water conservancy district.

The charge for municipal waters will average between $20 and $40 per acre-foot, varying in proportion to the cost of project facilities required to serve the various municipalities.

Additional project revenue will be derived from a 1 mill tax on assessed valuation of all property within the district boundaries imposed by the repayment entity which will contract for the repayment of project costs.

Senator MILLIKIN. You noticed the questions this morning regarding——

Mr. BEISE. Indirect benefits?

Senator MILLIKIN. No. The willingness or unwillingness of municipalities to make firm contracts on the subject. I assume someone will talk to that point.

Mr. BEISE. Yes, sir. I believe Mr. Christy and Mr. Powell can so testify.

You have already in the record the telegram from Pueblo. There will be a resolution offered here from the city of Colorado Springs.

Senator MILLIKIN. Is it true that before we start on any of these municipal water features, contracts will have to be complete?

Mr. BEISE. That is correct.

In addition, owners of present water rights will be charged $3 per acre-foot per annum for storage of their water in project reservoirs. Lastly, substantial revenues will be derived from the sale of electric energy.

The revised repayment program contemplates a modified Collbran repayment plan. Costs allocated to power and municipal facilities will be charged 2½ percent interest and the principal and interest charges amortized in a 50-year period.

Senator MILLIKIN. Pardon me for interrupting again. Will there be testimony as to the willingness of the owners of present water rights to pay $3 per acre-foot per annum for the storage of their water in project facilities?

Mr. BEISE. Yes, sir.

Senator MILLIKIN. Thank you.

Mr. BEISE. Therefore, the entire net revenues from power and municipal facilities will be credited to repayment of the irrigation features, which when combined with irrigation revenues will result in the repayment of all costs assessed to irrigation in 69 years.

Senator MILLIKIN. Have the sponsors considered whether it would be advisable to conform the interest rate to the present average cost of interest on Government securities, which I understand is slightly over 2½ percent?

Mr. BEISE. I rather imagine that the figure of 2½ percent was probably the then current going interest rate, and I assume they certainly would be willing to pay the then prevailing rate.

The Fryingpan project has been approved by the official State agency of Colorado charged with the duty of commenting thereon by the 1944 Federal Flood Control Act. The project report has been released to all affected States and Federal agencies. All States admit that the waters proposed to be utilized by the project are well within the States' share of waters in the Colorado River. The project is not opposed by any State or agency, although some offer minor suggestions in connection therewith.

Senator MILLIKIN. To which States has this project been submitted?

Mr. BEISE. The sevel States on the Colorado River Basin, being California, Arizona, Nevada, Utah, New Mexico, Colorado, and Wyoming.

Senator MILLIKIN. And Kansas?

Mr. BEISE. And Kansas.

Senator MILLIKIN. Arkansas?

Mr. BEISE. I believe not Arkansas, sir. I think it ceases with the submission to Kansas. Mr. Powell can advise me.

Was not Kansas the only State below?

Mr. POWELL. That is right.

Mr. BEISE. All matters involved in intrastate policies of Colorado have received most careful attention. The Colorado Water Conservation Board appointed a policy and review committee to review the project plans and to report back to the board.

Senator MILLIKIN. Briefly, at this point, describe the board.

Mr. BEISE. It was created by act of Legislature of Colorado and has nine representatives appointed by the Governor, representing the various river drainages of the State of Colorado on all valleys or, so to speak, the eastern and western slope. In addition, there are certain ex officio members of the board who are State-elected officials such as the State engineer, the chairman of the State planning commission, and others.

Senator MILLIKIN. It is charged with dealing with matters of this kind and making recommendations to them?

Mr. BEISE. It is, sir.

This committee had its own engineers develop the necessary data to determine the feasibility of the project. A special engineering subcommittee was appointed to make an independent analysis of the present and future western slope water requirements of excess waters in Colorado——

Senator MILLIKIN. These engineers appointed by the sponsors or by the State board?

Mr. BEISE. The special engineering committee was not appointed by the sponsors, and was appointed by the policy and review committee under the supervision and direction of Clifford Stone, director of the State water conservation board.

A special engineering subcommittee was appointed to make an independent analysis of the present and future western slope water requirements of excess waters in Colorado available for diversions and of the size of replacement reservoirs required by the State law.

In addition, this committee checked all figures made available by the Bureau of Reclamation and made modifications therein and concluded that there was ample water for the Fryingpan project which could be diverted to eastern Colorado without detriment to western slope present and potential users and fixed the capacity of the Aspen Reservoir at 28,000 acre-feet.

Senator MILLIKIN. Will someone tell us the exact functions of the Aspen Reservoir before you finish here?

Mr. BEISE. Mr. Royce Tipton and Mr. Powell can speak of the engineering functions, and Mr. Jean Breitenstein can speak of the legal functions of that reservoir.

The Federal Fish and Wildlife Service, the State fish and game department, the Izaak Walton League assisted in appraisement of recreational values involved and designated the required streamflows for preservation of fishing.

Senator MILLIKIN. Are those streamflows protected under the plan?

Mr. BEISE. They are the minimum streamflows specified in the operating agreement set forth between pages 20 and 23 of Senate Document 106 of the 82d Congress, 2d session.

Senator MILLIKIN. That will be the basic document of this law.

Mr. BEISE. That is the Magna Carta of the operation of the Fryingpan project.

Attorneys and water users cooperated in specifying conditions of project operation.

All of these recommendations were codified in a plan of operation contained in Senate Document 106 of the 82d Congress, pages 20 and 23.

Senator MILLIKIN. Does Senate Document 106 now require any amendment?

Mr. BEISE. Only as to the current——

Senator MILLIKIN. I notice the old valuations. I notice at the beginning we have a map which is partially inapplicable. I notice there are several miscallings of names of the project. Will that require amendment of the report?

Mr. BEISE. You anticipate me by two pages.

Senator MILLIKIN. All right, I will wait.

Mr. BEISE. This plan of project operation, which was approved by the policy and review committee, was submitted to the Colorado River Conservation District Board and the Southwestern Colorado Conservation District Board, being the only two statutory western Colorado boards officially charged with the duty of protecting their respective areas on proposed water diversions.

Senator MILLIKIN. Three are within the area of the Colorado River Basin?

Mr. BEISE. That is correct, and represent 14 of the 22 western-slope counties of Colorado.

Each of these districts endorsed the operating principles and the project unanimously and, in spite of two official requests subsequently addressed to the Colorado River Conservation District Board by residents of Aspen, that board refused to change its endorsement.

Finally, the Fryingpan project was officially approved in August 1951 by the Colorado Water Conservation Board and the Governor of the State of Colorado, who on June 12, 1953, telegraphed this committee reaffirming the approval by Colorado of the Fryingpan project. The project proponents do not believe that the increase in project costs necessitate resubmission of the project report.

Senator MILLIKIN. Did the Governor speak in behalf of the Colorado Water Board?

Mr. BEISE. Its phraseology, sir, I do not recall.

Mr. BREITENSTEIN. He is the chairman of the board.

Mr. BEISE. He is the chairman of the Colorado Water Conservation Board.

Senator MILLIKIN. He would be speaking as governor. It is possible but not probable that he could be speaking as governor and not be speaking as chairman of the Colorado board. May we assume that he is speaking for both in this inquiry?

Mr. BEISE. I certainly would assume so, and I think it is a most reasonable assumption.

Senator MILLIKIN. Go ahead.

Mr. BEISE. Three years have elapsed since the project report was written. The project report is based on 1949 prices and in this interim the identical project works have increased in cost from $147 million to $173 million, or a net increase of approximately $25 million. This increase has been allocated in the following amounts to the following facilities:

Flood control, $3 million; irrigation, $18 million; municipal, $3 million; and fish and wildlife, $1 million.

The irrigation increase has required an increase in charges for supplying irrigation water from $3.60 per acre-foot to $5.40 per acre-foot, and for storage of independent waters from $2 to $3 per acre-foot.

Senator MILLIKIN. That is a larger increase in irrigation than the original proportion of allocation of irrigation as contrasted with the other allocations, is that not correct?

Mr. BEISE. That is correct, sir. The increase of 25 million bears to 150 million, a ratio which is far less than the 50 percent increase which has been imposed upon irrigation.

The green-covered project report No. 7–8a; 49–1 is labeled "Gunnison-Arkansas Project, Roaring Fork Diversion." This name is a misnomer and results from its official use by the Bureau of Reclamation in investigating a comprehensive water-diversion plan from the Gusnison, as well as the Roaring Fork and Fryingpay Rivers to the Arkansas River. This plan was much greater in scope and is not the plan before the committee. The Fryingpan-Arkansas project is an independent unit which could be assimilated in the larger Gunnison-Arkansas project if, as, and when the latter is ever investigated and authorized. At the request of the State of Colorado, the name of this project was changed to the Fryingpan-Arkansas project. This same misnomer is applicable to the map in the fly sheet of Senate Document 106, concerning which the Senator asked, and the small map on the table and made available to the committee members should be substituted in lieu thereof for an understanding of the project.

In other words, all project features indicated on the map in the fly sheet of Senate Document No. 196, except the Aspen Reservoir and

the collection system of the Fryingpan River, should be ignored. In lieu thereof, the attention of the committee should be directed to the map prepared by the Bureau of Reclamation bearing the designation Fryingpan-Arkansas project dated April 1953.

Senator MILLIKIN. This project being a lesser plan than the one originally known as the Gunnison-Arkansas project, Roaring Ford diversion, stands independently and does not necessarily require any further enlargement to be a feasible multiple-purpose project, is that correct?

Mr. BEISE. Well stated and correct.

Senator MILLIKIN. In other words, if we approve this, we are not impliedly approving something larger?

Mr. BEISE. This is not the nose of the camel under the tent, and was said in the House.

It is practically impossible to obtain the endorsement of all persons on any project. Two men whose ranches and homes will be taken for the Aspen Reservoir head the opposition centering at Aspen, Colo. Fundamentally, this opposition is based on personal interests. Every objection that may be voiced has been previously considered in detail by the official boards of Colorado charged with the responsibility for approving or rejecting projects of this type.

The 1953 Colorado Legislature appropriated $100,000 for a survey of western Colorado waters, other than those affected by the Fryingpan-Arkansas project. This appropriation was the result of the request of the city of Denver for State approval of a potential project designed to divert water from a tributary of the Colorado River known as the Blue River, to the city of Denver. The appropriation was a necessary result of the resolution of the Colorado Water Conservation Board adopted at the time the Fryingpan-Arkansas project was approved, which resolution, after approving the project, stated, as Senator Johnson has so adequately stated this morning, that no further federally financed water-diversion projects from the Colorado River to the eastern slope of Colorado would be approved until complete surveys of western slope needs and waters became available.

The proposed Denver project is a federally financed project and hence the provisions of the resolution came into play. As a result of this legislation and appropriation, the Water Conservation Board created a conference committee to accelerate the appraisal and evaluation of these potentials which had been under study by Colorado and the Bureau of Reclamation for more than 20 years. The Fryingpan-Arkansas project is not to be reconsidered by that committee, nor will its prior approval in anywise be affected by the work thereof.

I might ad lib and say in response to the Senator's inquiry that the changes which are necessary to understand Senate Document 106, 82d Congress, 2d session, would simply be to substitute the new total costs of the project, the allocations to the various functions, and the charges on irrigation.

Otherwise, with the exceptions I have noted, it is and should be used by the committee in studying the project.

Senator MILLIKIN. Does the Bureau have any thought of making those corrections and bringing them to us in official form, and, secondly, is there any point in doing it?

Mr. BEISE. I see no point in doing it, sir. The letter to the President and the comments of the Bureau of the Budget, together with

what has been said here, should be ample explanation of those very few simple changes. I cannot speak, however, for the Bureau.

Senator MILLIKIN. This report will become an important part of any debate we have on the project.

I am just thinking out loud and I am making no suggestions. I am wondering whether it would be practical to have this report resubmitted completely corrected so that there cannot possibly be any confusion between what is in this report and what would be in an amended report.

Mr. TOMLINSON. Senator Millikin, the April 30 letter which Secretary McKay sent to the Bureau of the Budget and which was sent to this committee on June 9, I believe, does make those changes by use of the overlying document, which is the April 30 document. I think the two together comprise the current report, both as to present estimated cost and as to the modification in the repayment plan.

Senator MILLIKIN. It costs money to print these reports, and I do not want to suggest anything that is unreasonably costly. It is always better to have 1 document that contains the whole story than to have to shuffle around with 2, especially when the great body of the Senate will not have the benefit of these hearings.

Mr. TOMLINSON. The changes would be pretty minor. The letter is just a two-page letter, sir, with the new pay-out tables. Of course, we would revise the entire report——

Senator MILLIKIN. I am not suggesting it, but think on it, will you?

Mr. TOMLINSON. Yes, sir.

Mr. BEISE. Would it be possible, Mr. Tomlinson, to prepare a 1- or 2-page supplement to be attached to the copies of Senate Document 106?

Mr. TOMLINSON. That is what I was about to suggest when you first brought up the subject, Senator. This could be printed right on top of the other report. I think you would have in a condensed form the entire present thinking of the Department.

Senator MILLIKIN. I wish you would do something on it and discuss it with our technician.

Mr. TOMLINSON. I will be glad to.

(The supplement referred to follows:)

SUPPLEMENT TO SENATE DOCUMENT 106, 82D CONGRESS

There are set forth below the changes in the report on the Fryingpan-Arkansas project printed as House Document 106, 82d Congress, as a result of the overlying final report of the Secretary of the Interior dated April 30, 1953.

COMMENTS OF STATES AND AGENCIES

The views and comments received from States and agencies have been made a part of the report.

PROJECT NAME

The project name has been changed to Fryingpan-Arkansas project.

STATEMENT RELATING TO WATER POLLUTION

Certain statements relative to water pollution have been revised as recommended by the Public Health Service.

INTEREST COMPONENT

The use of the interest component as an aid in the repayment of irrigation costs is not recommended. In lieu thereof, net power and muncipal water revenues,

subsequent to the repayment of the commercial power and municipal water investments, would be used.

INTEREST RATE

The interest rate recommended for commercial power and municipal water investments is a rate equal to the average rate paid by the United States on its long-term loans outstanding at the date of authorization of the project. This rate has been estimated as 2½ percent for purposes of the studies in the report.

PROJECT COSTS

Project-construction costs have been revised to January 1953 price levels. The project-cost estimate on the new basis is $172,898,000. Also, there has been included in the construction cost to be repaid interest during construction on power and municipal-water investments.

ECONOMIC AND PAYMENT-CAPACITY ANALYSIS

The economic and payment-capacity analyses have been revised to reflect the recently adopted expected long-term price levels. In the economic analyses, the power benefits have been calculated on the basis of the value of power in the area. The revised ratio of benefits to costs is 1.48 to 1.0.

REPAYMENT

The revised-repayment plan proposes that power, municipal-water, and irrigation-water users all continue to pay until all reimbursable project costs are repaid. On this basis the period of repayment is estimated at 69 years with the power and municipal-water investments being repaid in 50 years after the last units serving these 2 purposes are completed.

Mr. BEISE. If I may, then, proceed to the second phase of my testimony.

Senator MILLIKIN. Yes.

Mr. BEISE. The witnesses who will testify, their names, their professions, and the subject matter of their testimony are as follows:

Mr. Harold Christy, engineer, member of the policy and review committee of the Fryingpan-Arkansas project, Colorado's director in the National Reclamation Association. He is in charge of the Colorado Fuel & Iron Co.'s water and power section. He is thoroughly familiar with the water requirements and supplies of the Arkansas Valley. He will testify generally concerning the need for this project water.

Mr. Ben Powell, project engineer of the Bureau of Reclamation, is most capable to answer any and all questions of physical works or costs and the economic feasibility of the entire project.

Mr. Jean Breitenstein, attorney, of Denver, Colo., is attorney for the Colorado Water Conservation Board, one of our outstanding attorneys of the West, most capable to answer any question which can arise concerning Colorado River waters or the operating principles contained in Senate Document 106.

The Honorable Dan Hunter, of Dove Creek, Colo., esteemed fellow citizen, member of the Colorado Water Conservation Board, president of the Southwestern Colorado Water Conservation District Board. He will testify concerning the action of the board in approaching the project and the wishes of southwestern Colorado.

Two farmers, Mr. Roy Cooper and Mr. Ted Ryan, will appear to testify as to the ability of the farmers to pay for and their desire to purchase, which are the questions I believe the chairman indicated a few moments ago concerning agriculture and the supplemental supply.

Mr. L. R. Patterson, an engineer appearing for the Public Service Co. of Colorado, with their proposal and willingness to spend some $6 million or more for the necessary transmission lines.

Mr. Lewis Amend, a citizen of the Arkansas Valley, thoroughly familiar with REA in the Arkansas Valley.

Mr. Royce Tipton, well-known consulting engineer, of Denver, Colo., consulting engineer for the Colorado Water Conservation Board, can answer any and all questions concerning the availability of water diverted by the project from the Colorado River, the adequacy of the compensatory storage provided by the Aspen Reservoir or any other engineering phases which involve the State program.

Mr. John G. Will, secretary, Upper Colorado River Basin Compact Commission, will testify as to the attitude of that commission concerning this project.

Mr. Jack Morrison, of the A. F. of L., and Mr. George White, of the CIO, both of Pueblo, will testify concerning the approval and endorsement of this project by organized labor.

Finally, Mr. Damien P. Ducy, president of the Water Development Association of Southeastern Colorado, will present a summary of the testimony, offering countless resolutions of many, many organizations and entities in Colorado.

The third and concluding phase of my testimony is a few comments on the Bureau of the Budget report.

I refer, firstly, to the comment of the Bureau that the repayment of the irrigation facilities should be restricted to a period of 50 years, being the first sentence in the fourth paragraph on the first page of their letter.

As has been mentioned this morning, there is no reason why the repayment obligation should be restricted to a 50-year interval when the life of the facilities constructed by reason of this grant and loan exceeds many, many times that arbitrary period.

Historically, the Bureau of Reclamation was authorized to construct projects having a 10-year period. Over the past 50 years that has gradually been extended. The reason is obvious. The simplest projects were first constructed. More complex projects remain. As they remain they cost more. By the same token, the type of construction involved is of such a character that its duration and life are more.

Lastly, I say in connection with that observation that the Government has triple security for its obligation after the 50-year period, for it then has the net revenues from power and municipal water as well as direct revenue from irrigation, whereas during the first 50-year period its security, so far as irrigation is concerned, is direct payment by irrigation.

Therefore, to a water attorney inexperienced in the field of national policy, it would appear that there is every reason and dictate for extending the repayment period to the 69 years for irrigation facilities, which was the requested basis of this project.

Senator MILLIKIN. The life of the project is estimated to be considerably beyond 69 years, is it not?

Mr. BEISE. Unquestionably, sir.

Senator MILLIKIN. Of course, in any kind of financing plan, you want to get your money back as reasonably soon as possible. It

probably would be unfeasible to extend it clear out over the estimated life of the usefulness of the project, but a 69-year period would certainly discount adequately the estimated useful life of the project, would it not?

Mr. BEISE. It certainly would. There is no reason to assume that the operation and maintenance costs would in any wise even remotely imperil the security of the Government on the repayment obligation if confined to the 69-year period.

Senator MILLIKIN. If the facilities were adequate. As you say, the best guaranty that the Government will be paid back is to build adequate facilities, is that not correct?

Mr. BEISE. That is correct.

Senator MILLIKIN. We have some experience as to the life of things of this kind, have we not? I mentioned this morning the Wilson Dam on the Tennessee River, Grand Coulee, and the Hoover Dam, are all now 20 to 30 years old. As we look back on it, it seems like yesterday, and think how fast that time has passed. Yet those three great installations have hardly reached the beginning of their useful life. It would have been very foolish on the face of it to have designed those installations on a 50-year life. Had they been designed that way, we would come up against the problem of enlarging them and rehabilitating them with all the terrible costs and expenses that would be involved. Is that not correct?

Mr. BEISE. That is correct, Senator.

My second comment pertains to the statement of the Bureau of the Budget in the second paragraph on page 2, first sentence, reading:

> Federal and State agencies, in commenting on the original project report, questioned (1) the high cost of a limited supply of supplemental irrigation water; (2) the ability of the water users to repay annually as much of the irrigation costs as proposed * * *.

I would like to stop at that point and comment separately on those.

Our answer to that observation is that any water which was in any wise adequate to begin to relieve the dire need of the Arkansas Valley must be imported from the Colorado River, and as a consequence and of necessity the costs in connection therewith are high. We have no choice. Mother Nature made that barrier to start with.

However, two expert farming witnesses who will this day testify, are here to answer that very question, and they will assure this committee that an average charge of $5.40 per acre-foot for supplemental water is cheap crop insurance, and that the farmers of the area are anxious, willing, eager, and most able to pay for and purchase that quantity of supplemental water which they so sorely need.

Senator MILLIKIN. That will be tied up in nonbreachable contracts, is that correct?

Mr. BEISE. That is correct.

You asked a while ago, and possibly I should comment now: In the same year the water conservation board was created in Colorado in connection with the Colorado-Big Thompson project, there was passed the Colorado Water Conservancy District Act, which permits a quasi-public corporation to be organized as the repayment entity which not only has the power to contract for the repayment of the repayable costs of this type of project, but has the administration and allocation of the waters and enters into contracts therefor, and

in addition has taxing power over all lands, whether or not they purchase water. In fact, on all property within the district boundaries.

It gets into the matter of indirect benefits, which was mentioned earlier here today.

Senator MILLIKIN. You have testified:

> The flow of the Arkansas River to Pueblo has an annual variation from approximately 200,000 acre-feet minimum to a flow in excess of 1 million acre-feet.

It seems to me that that points up rather graphically the need for that last half-foot of irrigation water if you want to mature your crops. The maturity of a crop with that last water that will be brought by this project is the same as the whole crop, is it not, because without it you do not have a crop.

Mr. BEISE. Precisely. By the time that last irrigation is needed, the farmer may well have several hundred dollars invested in that crop. If he fails to produce a crop and $5.40 an acre-foot of water would have saved it, it is ridiculous to say that the economy of that farmer will not support that charge.

Senator MILLIKIN. It is like a 100-yard race, making a very brilliant dash for 90 yards but being unable to make the last 10.

Mr. BEISE. That is correct.

Senator MILLIKIN. If you do not make that last 10, you do not get the jackpot; do you?

Mr. BEISE. That is right, sir.

Senator MILLIKIN. The farmers want that water to mature their crops, to bring them finally through, and they are willing to pay.

Mr. BEISE. That is absolutely true.

Senator MILLIKIN. Would you say that what they are paying is reasonable, considering the benefits that they get from the payment?

Mr. BEISE. Unquestionably.

Senator MILLIKIN. Has anyone challenged that?

Mr. BEISE. No one, except the Bureau of the Budget.

Senator MILLIKIN. And the farmers who are here will testify to the accuracy of what you are saying?

Mr. BEISE. That is precisely right.

I comment next on the third point in that same sentence of that same paragraph:

> * * * (3) the ultimate amount of transmountain diversion and its effect on the quality and use of Colorado River water available to the lower basin.

I point out that this observation is academic in character. The Fryingpan project diverts 70,000 acre-feet of water on an average. Just assuming an average annual Colorado River flow of 15 million acre-feet, the project uses one two hundred and fourteenth, or less than one-half of 1 percent of the flow of the Colorado River.

Senator MILLIKIN. So quantitatively, it is almost microscopic.

Mr. BEISE. Absolutely.

Furthermore, I might observe as a gratuity that there is nothing in the Colorado River compact, in my opinion, concerning the quality of water.

Senator MILLIKIN. If there were something in it about the quality of the water, would not the diversion of this relatively infinitesimal amount of water have an infinitesimal effect on the problem?

Mr. BEISE. I would still let my original statement stand, if there were such a provision in the compact.

Next I would speak of this benefit-cost ratio, direct and indirect benefits, concerning which Governor Aandahl testified at length this morning.

I well realize that I am not too qualified to express an opinion on a matter of such a complicated formula, except to observe that this is a development of recent years, for I know of my own knowledge in connection with the Pine River project in Colorado there was never any question in the formula of direct or indirect benefits. It has always been my understanding that this doctrine evolved in relatively recent years, and was originally applied to flood-control projects by the Army engineers.

If that be so, it might possibly be applicable to flood-control benefits on this project, which are less than 10 percent.

Senator MILLIKIN. The flood-control projects go much further with indirect benefits than you do in reclamation.

Mr. BEISE. Indeed.

Senator MILLIKIN. Taking all the benefits—I wish I had the exact language but including all considerations of public interest, if the benefits are greater than the cost, it is a feasible project.

Mr. BEISE. Reclamation has always been based on the premise that, except for such flood-control benefits which might incidentally be involved, the Government recoups its investment in the project.

Senator MILLIKIN. The Government not only recoups its investment in the project from the strict investment standpoint, but I was developing the thought this morning that the indirect benefits are the benefits that have poured taxes into the Federal Treasury that go far beyond the cost of the project. The expansion of your economy in the Arkansas Valley resulting from this project, will far exceed any computations the Bureau of Reclamation might have put in here on indirect costs. You have a multiplier factor that no one has ever completely figured out, but the results of which are obvious.

Take out the irrigated acreage on the northern Colorado, take it out of your Arkansas Valley, and we would be back on a grazing State basis. If we were, instead of putting a half billion dollars a year into the Federal Treasury, I do not know what we would be putting in, but I venture to say it would not be more than a couple of hundred million at best.

Mr. BEISE. Sir, the State of Colorado answered this question by taxing all property within the boundaries of a conservancy district, whether or not it receives any water. The merchant in the town must pay a levy of not more than 1½ mills per annum.

Senator MILLIKIN. And there will be a levy of that kind in connection with this project?

Mr. BEISE. If it applies in Colorado, I certainly think that that kind of benefit should be recognized by the Federal Government in evaluating a project of this character. I think the formula ignores one of the basic truths of western economy.

Senator MILLIKIN. Is it not a fact that if the costs of multiple-purpose operations were confined strictly to direct costs, it would probably stop the development of the reclamation side of all multiple-purpose projects in the future?

Mr. BEISE. We would have built the last project. That would be my opinion.

Senator MILLIKIN. So unless we are willing to abandon our reclamation policies in this country as they have been, unless we are willing to abandon those, unless we are willing to stop all Government assistance in the financing of reclamation projects, we cannot accept the principle that we must confine these cost allocations to direct costs, is that not correct?

Mr. BEISE. That is correct.

Senator MILLIKIN. I think Congress will have an answer to that.

Mr. BEISE. The fifth point concerning which I offer an observation is contained in the fifth paragraph on the second page of the Bureau of the Budget report, and that is that:

* * * a separate evaluation should be made of the feasibility of importing water from the Colorado River Basin, considered as an incremental addition rather than an integral part of the project.

I point out respectfully that the original investigation was of a large project far vaster in scope, calling for diversions from the Gunnison River. It involved such a terrific sum of money that the next logical step at the request of the water users was taken, and that is that the Bureau of Reclamation then investigated the smallest possible feasible project.

The result of that is the Fryingpan project, which is submitted to this committee this day. Any single-purpose project is so expensive or so limited in scope that it fails even remotely to approach the problems present in the Arkansas Valley.

I say, however, that a separate evaluation was in effect studied by Mr. Powell, and he, I believe, can give this committee a complete answer to that observation of the Bureau of the Budget.

Senator MILLIKIN. Will you do so, Mr. Powell?

Mr. POWELL. I will, Senator.

Mr. BEISE. I next comment on the observation contained in the last sentence of that same paragraph, on page 2 of the Bureau of the Budget report:

* * * there is no evidence in the report indicating a willingness by the irrigators to repay the proposed charges for an average annual supplemental water supply of about one-half acre-foot per acre.

If the author means the $5.40, he is correct, because that charge evolved after Senate Document 106 was printed. However, the irrigators are here this day present, and Mr. Ryan and Mr. Cooper will testify that they are not only willing, they are anxious and eager, to repay the average charges for this one-half acre-foot per acre of supplemental water which, in their opinion, as a farmer might say, is cheap crop insurance.

Senator MILLIKIN. Before this project gets underway, the appropriate irrigation districts and conservancy districts will have bound themselves to the obligation, is that not correct?

Mr. BEISE. That is precisely right.

Senator MILLIKIN. There is no purpose in our proceeding with this project, completing it, and then going around asking for contracts to support it; is there?

Mr. BEISE. No, sir.

Senator MILLIKIN. These things will all be done in advance?

Mr. BEISE. That is right.

Senator MILLIKIN. You say that without reservation or qualification of any kind?

Mr. BEISE. I do.

I go further and say that insofar as municipal water is concerned, the project report itself says that the cities must show their inability to supply these things before the Secretary can build those features. So, in other words, your assurance of a contract, unqualified and unconditional, will be applicable not just to irrigation features, but to municipal features as well.

The next paragraph, being the last paragraph at the bottom of page 2, contains a statement in the first sentence reading:

> Plans for municipal water supplies appear doubtful because of the high water rates, optimistic estimates of average water deliveries, and uncertainty of including all proposed facilities and functions in the ultimate plans.

Senate Document 106 shows that the average acre-foot charge varies from approximately $20 to $40 per acre-foot per annum for municipal water. That cost varies as the cost of facilities required to serve the particular municipality. In other words, we do not have a postage stamp rate of delivery of municipal water. If the town of Eads, which it does, now exists by paying $5 per tankload of water, I say that an acre-foot of water now costs the city of Eads over $1,600 per acre-foot. How can it then be said that they cannot afford to pay for municipal water these average rates which are proposed in this project?

The fact is that where your life depends on municipal water, you can afford to pay just what that water costs, or the town must perish.

I go further and I observe that the project plan does not call for the construction of any facility not previously constructed on Federal reclamation projects. I am advised that the second barrel of the San Diego aqueduct, the Metropolitan Canal, the Salt Lake aqueduct of the Provo River project in Senator Watkins' district, and possibly the Canadian River project in Texas, and others, have all involved similar municipal facilities.

Mr. Powell, in response to the question of Senator Millikin, will be glad to describe those facilities.

Next I would like to observe concerning the second sentence of that——

Senator MILLIKIN. Let me ask you again, does not the operating plan make it very clear that you shall have contracts on these municipal water supplies?

Mr. BEISE. Sir, that is the very basis of the report, contained in paragraph F on page 25 of Senate Document 106, reading:

> All or any part of the specific municipal water-supply systems described in this report be constructed by the Secretary of the Interior, only after satisfactory evidence is presented to the Secretary of the Interior that it would be infeasible for the communities involved to construct or to finance the construction of such work themselves, singly or jointly.

It is difficult for municipalities reaching from Colorado Springs for several hundred miles, you might say, at least 150 miles down the river, to unify their requirements without some major entity to deal with, and that is where this proposed district that you and I speak of would come into play, and only after firm contracts are again signed, sealed, and delivered, would that phase of this project be constructed.

I want to observe concerning this statement of the Bureau of the Budget:

> We also believe that costs of correcting damages to fish and wildlife resources caused by the building of the project should be treated as part of the construction costs and allocated to the various purposes in the same manner as other damages, including relocations.

I say that that statement is erroneous, and whoever prepared it did not comprehend the project report. The Fryingpan project does not cause any damage to fish and wildlife. To the contrary, the project proposes to better the existing conditions by improving the flow of the Roaring Fork River.

To illustrate my point so the committee can understand it, I would say this: On the map if you would envision the capital letter "Y" with the Twin Lakes Reservoir & Canal Co. diverting from one fork of the "Y," the Fryingpan project diverting from the other fork, and the main stem of the "Y" being the Roaring Fork River above Aspen, you have then this situation: The Twin Lakes Reservoir & Canal Co. has agreed to forego asserting their legal vested right to divert waters from one fork of this "Y" if in turn the project will make available to them, without cost, the same amount of water that they could have captured had they asserted their rights.

Accordingly, as a result of numerous meetings with most competent fish and wildlife men, both Federal and State, and the Izaak Walton men themselves—Mr. Penfold—the very flows which they recommended have been specifically and categorically designated and inserted in the operating principles contained in Senate Document 106.

I have forgotten whether it is Public Law 732 or 734 that had to do with fish and wildlife, sir, but I point out that by reason of the provisions of this project, we propose to better, by means of a legal exchange, as we term it, in Colorado, the fish flows on the Roaring Fork above the mouth of Hunter Creek.

Senator MILLIKIN. There are no fish-flow problems on the eastern slope of any great magnitude, are there?

Mr. BEISE. As a result of this project?

Senator MILLIKIN. Yes. It struck me when I read this report that someone was thinking of the Columbia River, where we have the question of salmon runs and escalators for salmon and elevators, and all sorts of special things in connection with salmon runs. They probably thought we run salmon out there in the Arkansas River.

Do you know of any salmon in the Arkansas River?

Mr. BEISE. I know of no salmon. I never caught a salmon, sir. I have caught a few suckers, but no salmon.

At the moment, at Turquoise or Sugar Loaf Reservoir the public uses that by sufferance. That reservoir would be substantially enlarged. It is a holdover reservoir, as I use that term advisedly, to firm power. As a consequence, the water levels will fluctuate far less than Pueblo Reservoir. It will be very much enlarged, and I would say that the man-hours of recreation use of that enlarged reservoir will far more than compensate for any lessening in possibly some small tributary that might otherwise be adversely affected on the eastern slope.

Or, putting it otherwise, the fish and game associations on the eastern slope at Pueblo and on up the river have unqualifiedly endorsed the Fryingpan project.

I comment lastly and conclude with the first sentence of the last paragraph on page 3 reading:

> Our review indicates that further study of various aspects of the project might be warranted.

Sir, that is carrying coals to Newcastle. The project has been investigated by the Bureau of Reclamation itself for more than 10 years. The State of Colorado made an independent engineering survey of nearly 3 years. The east slope and west slope negotiated for over 2 years.

I conclude by saying investigations have reached the point of diminishing returns.

Senator MILLIKIN. Thank you, Mr. Beise.

Mr. BEISE. Thank you, Senator.

Senator MILLIKIN. Who is the next witness you desire to call?

Mr. DUCY. We would like to present Mr. Powell next.

## STATEMENT OF BEN F. POWELL, AREA ENGINEER, BUREAU OF RECLAMATION, PUEBLO, COLO.

Mr. POWELL. I have a prepared statement of some 10 pages.

My name is Ben F. Powell. I am area engineer for the Bureau of Reclamation. My office is located in Pueblo, Colo., in the Arkansas Valley.

Senator MILLIKIN. You are the area engineer of the Bureau of Reclamation?

Mr. POWELL. Yes, sir.

Mr. Chairman, with your permission, I think I will take this statement and go through the locations and the physical features of the project on the map, on the profile, and on the diagrams.

This statement includes the costs, the allocations, and the benefits, and at the same time I will answer the questions which have been put to me before and during the demonstration of the charts. I believe in that way the whole thing will move along much faster and I can avoid repetition of some of these items which have been so well demonstrated by my colleagues.

This project is multiple purpose and has the purpose of serving irrigation, municipal water, hydroelectric power, flood control, and sediment control. Reclamation and fish and wildlife benefits also accrue.

The average amount of water to the farmer at the headgate is over 185,000 acre-feet. The water to the municipalities from the diversion and flood storage is 15,000 acre-feet. In addition, there are 2,000 acre-feet stored for the city of Pueblo which they now import through the Wurtz ditch.

In addition the project will provide storage for an importation of 14,900 acre-feet of water by the Twin Lakes people in their own behalf for storage in their present reservoir enlarged. The acreage involved is 322,000, all of which lies on the main stem of the Arkansas River above the Kansas State line and below the city of Leadville.

The present shortage, as has been stated, is about 35 percent. That amounts to about 340,000 acre-feet of water.

Senator MILLIKIN. Tell us the main function of the Twin Lakes and the Wurtz ditch. Let us get that located in the whole picture.

Mr. POWELL. North of Rocky Ford, about 50 miles east of Pueblo, is the Twin Lakes irrigated area of about 60,000 acres of land, all served by the Colorado Canal, which is a canal owned by this Mutual Ditch Co. They have rights from the Arkansas River which are probably midway between senior and junior, using those terms in the extreme.

In the 1930's they proceeded with a transmountain diversion at the head of the Roaring Fork River to take water from this Roaring Fork River across the mountain and into their Twin Lakes Reservoir. The Twin Lakes Reservoir is about 20 miles due south of Leadville. It is just west of the Arkansas River. It is at an elevation of 9,200 feet. It holds, as I remember, about 56,000 acre-feet of water when full. It is a natural reservoir, and the capacity has been developed largely by an outlet channel cut through the natural dike. This diversion is decreed in the amount of 510, I believe, second-feet, and has an additional decree for enlargement to over 600 second-feet.

Senator MILLIKIN. Can you translate that into acre-feet?

Mr. POWELL. In a yearly operation on the average, Senator, that 500 second-feet will deliver and has delivered between 35,000 and 40,000 acre-feet of water.

This diversion by minor improvement and within the decree, is capable of transferring 53,000 acre-feet of water from the west slope to the east slope of the Continental Divide, which is between Aspen and the Twin Lakes on the Arkansas River.

Does that answer your question?

Senator MILLIKIN. That answers my question. The reason I wanted you to explain it is because the Twin Lakes and the Wurtz ditch form a part of this plan, and I thought we might as well get it identified as you went along.

Go ahead.

Mr. POWELL. This water may be taken from the Roarking Fork without limitation, except for prior rights on the river which might lie below the point of diversion. The water from the Twin Lakes is discharged into the Arkansas River and is again taken out at the headworks about 20 miles below Pueblo and of the Arkansas River, on the left bank near the town of Boone.

Senator MILLIKIN. Which is the Wurtz Canal?

Mr. POWELL. The Wurtz Canal is a contour diversion from the head of the Eagle River, which in turn is a branch of the upper Colorado River at about this point [indicating], north and west of the city of Leadville. It is a small contour ditch which empties through a divide into the headwaters and more particularly the Tennessee Fork of the Arkansas River. This canal is capable of diverting something over 2,000 acre-feet of water a year.

Senator MILLIKIN. While you are at it, show us the Fryingpan.

Mr. POWELL. Here is the Fryingpan River. Here is the North Fork; here is Lime Creek; here is the Main Fork. Ivanhoe Gulch is in here. Here is the South Fork; here is the collection system what we term the South Side collection system all in tunnels. We have the North Side collection system running from Lime Creek due south to the junction with the South Side system also in covered conduit or tunnel.

Senator MILLIKIN. Will you show the relations of the Fryingpan. the Roaring Fork, to the Gunnison and to the Colorado Rivers? Just point that out quickly.

Mr. POWELL. This is the Fryingpan system; this is the Roaring Fork system.

Senator MILLIKIN. The Fryingpan runs into what?

Mr. POWELL. Roaring Fork.

Senator MILLIKIN. The Roaring Fork runs into what?

Mr. POWELL. Into the Colorado at Glenwood, and the Colorado passes Grand Junction, and passes out of the State at Cisco, Utah. The Gunnison River is south of this area and contiguous to it. It runs west through the city of Gunnison, then through the Black Canyon National Monument, through the town of Delta, and joins the Colorado River at Grand Junction.

Senator MILLIKIN. We are not now concerned with the Gunnison or any of its tributaries?

Mr. POWELL. That is right, sir.

I think that description on the western slope of the diversion project is satisfactory in detail.

On the east slope, after the water passes from the junction of the north and south Fryingpan collection systems through the Continental Divide tunnel, 6 miles in length, it flows into the enlarged Sugar Loaf Reservoir, now 17,000 acre-feet, to be enlarged to 117,000.

Senator MILLIKIN. Who owns the Sugar Loaf Reservoir?

Mr. POWELL. This reservoir is the property of the Colorado River Fuel & Iron Co.

Senator MILLIKIN. That, too, will have some relationship to this plan; is that right?

Mr. POWELL. Yes, sir. From the Sugar Loaf Reservoir water is taken by canal to the upper end of the Twin Lakes Reservoir. At this point energy may be generated by hydroelectric turbines through a head of 500 feet. From the Twin Lakes Reservoir water will run south to the Otero Reservoir, called Clear Creek Reservoir, and again through a head of some 225 feet power may be generated.

Senator MILLIKIN. Who owns the Otero Reservoir?

Mr. POWELL. It belongs to the Otero Canal Co.

Senator MILLIKIN. It serves an area down in the valley?

Mr. POWELL. It serves an area south of La Junta and west of King Arroyo. From this Otero Reservoir the power canal runs about 6 miles southward and drops through another head of about 400 feet, with a tailrace on the Arkansas River.

Again by canal after going south about 20 miles, there is engendered another fall of about 300 feet at Chalk Creek. Going south again about 4 miles we have another fall of about 200 feet. We call this Pancho. The previous drop at Chalk Creek is the Princeton Drop, named for the Princeton Mountain, which is north of Chalk Creek and a little west of the powerplant.

The final drop of this upper series, making six drops in all, is the Salida powerplant, located about 10 miles above the city of Salida, and on the Arkansas River at the lower end of this system, which is in all 60 miles in length.

Senator MILLIKIN. Are all those drops exploited at the present time?

Mr. Powell. Fully, sir.

Senator MILLIKIN. Who owns those powerplants?

Mr. POWELL. In the plan these powerplants are to be paid for by the——

Senator MILLIKIN. I do not make myself clear. At the present time what power is being generated there?

Mr. POWELL. There are no generations by hydro power.

Senator MILLIKIN. Under the plan all of the drops that you have mentioned will be exploited with powerplants?

Mr. POWELL. That is right.

The diversion across the mountain is made at an elevation of 10,000 feet. By this process which I have outlined the water is delivered to the river with the energy removed at an elevation of 7,300 feet. From that point to Pueblo the river drops about 2,500 feet. At this time we do not feel that further hydroelectric energy should be developed. However, it is entirely possible to generate energy through this course of the river.

Water delivered to the river at this point will descend to and be reregulated in the Pueblo Reservoir, which is situated about 7 miles above the city of Pueblo. This reservoir is projected as a reservoir of 400,000 acre-feet, of which 93,000 acre-feet is laid aside for the sediment which we compute will accumulate in a period of 100 years.

Senator MILLIKIN. Is there a reservoir there at the present time?

Mr. POWELL. There is a small barrier dam for the city of Pueblo, but it is not a potential structure. It is really not a reservoir.

Of this capacity, about 100,000 acre-feet is laid aside for floods and the balance of the capacity is for conservation storage.

I did not give the capacity of Twin Lakes. That is now 56,000 acre-feet and will be about 260,000 acre-feet under the projected plan.

This installation between Sugar Loaf Reservoir and the Salida powerplant will be in the amount of about 93,000 kilowatts. The plant at Pueblo Reservoir brings the total to 104,000 kilowatts, and the yearly generation, as stated this morning, is 505 million kilowatt-hours per year, on the average.

Senator MILLIKIN. How much firm, again?

Mr. POWELL. Strictly from the hydroelectric operation and without support from thermal power, 400 million kilowatt-hours of that production is deemed firm.

Senator MILLIKIN. What are the potentialities of getting firm power from coal?

Mr. POWELL. The Colorado Fuel & Iron Co. have an installation here I believe in the neighborhood of 60,000 kilowatts. They may choose to feed power back into the system. If they do, this hydroelectric power can be detained. That will firm up some. We have the installations of the Southern Colorado Power Co., and they have something in the neighborhood of 60,000 kilowatts of dependable power. This area south in the neighborhood of Walsenburg and Trinidad is bountifully supplied with a high quality of coal in enormous quantities, and the production of thermal power might be possible from that source. However, a large part of the generation area at the present time is from gas coming in from the South.

As stated this morning, the power from the project is already bid for. There is no question about the market.

In regard to the municipal water plan, we endeavored, when this report was first assembled back in 1948, to make water available to

these cities with no effort to distribute the water to the towns. However, after the preliminary report in the field draft was inspected by the local people, they requested that delivery facilities be included in the plan.

We have in the plan now, all below the Pueblo Reservoir, a filter plant, 175 miles of line reaching from the Pueblo Reservoir to Lamar, north to Eads, and north to Crowley. This line serving the valley is a 26-inch line where it leaves the filter plant.

Senator MILLIKIN. Do most of those towns pump that water now?

Mr. POWELL. Most of those towns pump their water, and it is of very poor quality.

Senator MILLIKIN. What is the matter with it?

Mr. POWELL. It is heavily alkalied. I can give you the statistics. The water at Pueblo sometimes exceeds 600 parts per million of hardness.

Senator MILLIKIN. Out of pumped water?

Mr. POWELL. Out of pumped water from the river. That is between 300 and 400 grains of hardness greater than the allowable specified by the United States Public Health Service.

The town of LaJunta has water of hardness which reaches something over 50 grains per gallon. It is excessively hard. The town of Las Animas is the same. None of this water, with the exception of a small supply here at Fowler, is of reasonable quality for domestic use.

I think I will pass now to the charts. However, before I do I want to read the requested cost estimates for the municipal water.

Senator, you requested this morning an itemized statement of the costs of the municipal water plants. I have here a statement which was furnished to the committee of the House. The specific municipal water costs are as follows: Purification plant at Pueblo, 55,500,000 gallons per day, cost $7,148,000. Conduit to Pueblo from the filtration plant, two 20-inch lines, approximately 7 miles in length, $1,735,000. Arkansas Valley pipeline, 175 miles in length, 26 inches to 8 inches in diameter, $10,631,000. Municipal pumping plant at the Pueblo Reservoir, pumping water from the lake at the head of the Pueblo Reservoir to the purification plant, $1,470,000.

The next three items are related to the Colorado Springs system and they consist of Oil Creek-Brush Hollow Canal, which was listed in Document 106, $223,000. Oil Creek diversion dam, $138,000. Colorado Springs pumping plant, $155,000. Total specific water costs, $21,500,000.

Joint costs; this is the cost which the municipal system will be obliged to bear of the total importation system, which ends at the Pueblo Reservoir and includes Pueblo Reservoir. This is for their share of the reservoir tunnels and other facilities: $11,154,000.

This, added to the total above makes a total of $32,654,000. To this, under the instructions from Secretary Aandahl, is added interest during construction in the amount of $1,154,000, making a total of $33,880,000 for the reimbursable portion of the municipal water system.

Senator MILLIKIN. Do you wish to put that in the record?

Mr. POWELL. I think so.

(Tabulation referred to is as follows:)

UNITED STATES,
DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
*Washington, D. C., June 12, 1953.*

Hon. JOHN R. PILLION,
*House of Representatives, Washington 25, D. C.*

MY DEAR MR. PILLION: There is given below, in response to your verbal request, the cost of individual items which make up the municipal and industrial water allocation in the Fryingpan-Arkansas project cost.

| | |
|---|---|
| Specific municipal water costs: | |
| Purification plant (Pueblo), 55,500,000 gallons per day | $7, 148, 000 |
| Conduit to Pueblo, two 20-inch lines, approximately 7 miles | 1, 735, 000 |
| Arkansas Valley pipeline, 175 miles 26-inch to 8-inch diameter | 10, 631, 000 |
| Municipal pumping plant | 1, 470, 000 |
| Oil Creek-Brush Hollow Canal (Colorado Springs feature) | 223, 000 |
| Oil Creek diversion dam (Colorado Springs feature) | 138, 000 |
| Colorado Springs pumping plant | 155, 000 |
| Subtotal | 21, 500, 000 |
| Joint costs: Reservoirs, tunnels, etc., for importation and storage of water | 11, 154, 000 |
| | 32, 654, 000 |
| Interest during construction | 1, 154, 000 |
| Total | 33, 808, 000 |

Sincerely yours,

G. W. LINEWEAVER,
*Assistant Commissioner.*

Senator MILLIKIN. How will that be reimbursed by the municipality? Will they reimburse the capital cost in one fell swoop or will it be amortized out of service charges?

Mr. POWELL. This cost, including the operation and maintenance and repair will be amortized by a service charge. You do not care for the itemized charges?

Senator MILLIKIN. I would like to ask you a question that goes to what we are just talking about as well as estimation of costs. Do you use any system different from conventional systems used by engineers to estimate what the cost of things will be?

Mr. POWELL. No, Senator.

Senator MILLIKIN. Since the Bureau comes in for criticism on that subject, tell us how it is done.

Mr. POWELL. Senator, I am the project engineer. I am responsible for the surveys and the cost estimate. However, when I made my cost estimate I then went to the Chief Engineer to get all the information that I could on similar work and contracts and construction, up to the present time, in order to include all of the advanced costs due to inflation and the war.

From these costs, taking those which were comparable, and always leaning toward the high side, we formed an estimate of the cost of the project. Where I am the most concerned is in my surveys and estimates of quantities. I have instructed my office, and I have seen to it very carefully, that when there were two alternates we always chose the one which would result in the highest cost.

Where we had a canal to estimate, we saw to it that the canal estimate expressed the largest amount of yardage which would be put in that canal estimate under the most conservative type of construction. That also applies to the dams. Where there was a question

about the method of construction or the construction features as they were finally determined, we always took the plan which would result in the most conservative estimate, and I mean the largest estimate.

Senator MILLIKIN. That has characterized all of your estimates throughout this project?

Mr. POWELL. Entirely.

Senator MILLIKIN. Are there any features of the project where you have not followed that practice of being extremely conservative in your costs?

Mr. POWELL. No, sir.

Senator MILLIKIN. In estimating your costs do you follow the conventional practices of cost-estimate engineers in private life in reaching your result?

Mr. POWELL. We do, sir, except inherent in Government operations there are certain added obligations for services, and I do say that we put in overhead and contingencies which are more liberal than those which a private firm would put in.

(Brief recess.)

Senator MILLIKIN. All right, Mr. Powell, you may resume.

Coming back to this cost business, give us a little detail on your organization of a cost job. You have a pipeline to run 175 miles. How do you organize that in your office? Who does the estimating?

Mr. POWELL. I have in my office an estimating office under the office engineer. He has a very small force. There are usually four people in that office. In addition to that, I have a field-survey party. This field-survey party goes to the field and gets the field characteristics which go to make up the maps and plans or the basis for the maps and plans. From that we estimate the quantities in dirt, the length of pipe, the cubic yards of concrete, the amount of steel or the compacted fill of the dam or the riprap or the headgates or the turbines or the generators or the facilities for protecting the electrical equipment, both in the powerplants and in the operating facilities of the dam.

From these quantities, multiplied by the unit costs, which are first suggested by us, checked by the chief engineer and in addition checked by the regional office, we make out the estimate.

Senator MILLIKIN. Has any one made a critical analysis of your cost estimates of this project?

Mr. POWELL. The estimate has been given to the Colorado Water Conservation Board, and their consulting engineer, Mr. Royce Tipton, who is an internationally famous engineer and who practices in North and South America and Asia and I believe in Europe, a very competent engineer, has had his staff very carefully review this estimate, and the other day he characterized this estimate as having his categorical approval as being an adequate estimate of cost.

Senator MILLIKIN. He made no important criticisms of it?

Mr. POWELL. No important criticisms.

Senator MILLIKIN. Go ahead with your chart.

Mr. POWELL. If you will pardon me, at this point I would like to introduce the results of those estimates. They appear on page 8 and consist of a total sum of $172,898,000, of which $149,727,000 is repayable and allocated to various functions.

With your permission I will pass to the charts. In the interest of brevity and progress I have eliminated over half of these charts but

I deemed pertinent this pie (chart) which illustrates the average annual crop sales.

These are taken from authentic records, and at the present prices and present yields the crop sales are $15,565,000, and the losses due to shortage of water amount to $4,612,000. If the project is constructed with the indicated supplemental water available, the farmer will be able to save $2,508,000 of these crop losses annually.

This chart illustrates the annual average livestock production, the losses, and the recoverable losses. The present livestock production is $11,086,000. The losses due to shortage of water and consequent lack of feed, are $2,134,000.

Senator MILLIKIN. For what year is that?

Mr. POWELL. These are average over history. I am sorry; that is for the years 1931 to 1944 for the yields. The agricultural prices are the 1910–14 equals 100. The index for this determination is 215. That is the index and the price recommended, as I understand, by the Department of Agriculture for use.

I might say at this time that the present index of prices received by the farmer is 264.

Senator MILLIKIN. Were not losses particularly severe due to drought within the last year?

Mr. POWELL. They were. The losses were very severe in that country.

Senator MILLIKIN. In other words, the losses within the last year or so would be much worse than the average?

Mr. POWELL. I think so.

The present livestock production is $11,086,000, the losses $2,134,000, and the protection which the project would give against these losses would be $1,161,000.

This is a combination chart, combining the two previous charts. It shows the present production at the prices and indices shown: $26,652,000 agricultural production, a present yearly loss of $6,747,000, and a recoverable from this loss of $3,669,000, if we had this supplemental water which is inherent in the project.

Senator Millikin, with your permission I would like to offer for the record this revised and up-to-date map of the Fryingpan-Arkansas project.

Senator MILLIKIN. We will accept it in the record and if possible we will put it in our report. I do not know whether it is possible. In any event, it will be a part of the record.

(The map referred to is on file with the Committee:)

Mr. POWELL. You have requested me to pursue the suggestion further of dividing the project into two parts, one part the portion on the east slope and pertinent to the Arkansas River, and the other portion the importation development.

I have here a study made by my staff in the Pueblo office, and briefly the Arkansas River development and the importation development as here broken down for purpose of analysis are not portions of a practicable overall project. They are two separate projects. You cannot divide the project into two parts. However, for analysis purposes we have analyzed those features on the east slope and those features on the west slope separately. And these are our conclusions.

The Arkansas River increment includes only conservation of Arkansas River flood flows, storage of winter water, and increased

utilization of the Wurtz ditch diversion, a city of Pueblo structure for municipal purposes. The facilities required are the Pueblo Reservoir. The purposes are irrigation, flood control, municipal water, increased use of the Wurtz ditch diversion, and improved water quality and sediment control.

The water supply would be municipal water, 2,000 feet, increased headgate supply for irrigation, including usable return flow, the total amounts to 102,000 acre-feet. The cost of construction would be $41,524,000 and an annual cost of $12,722 for operation and maintenance.

The benefits of all functions would come to over $2 million, and the benefit-cost ratio under our methods would be favorable. However, repayment is infeasible; municipal water would repay in 30 years with interest at the rate of 2 percent, provided 2 percent was the rate. For analysis we used 2 percent. That is a minor matter, and on its own it looks all right.

Irrigation would require over 200 years without assistance from municipal water, and about 170 years with the municipal water assistance. In other words, the project would be seriously infeasible.

We come to the importation development, and the importation development would include the Fryingpan diversion and the Twin Lakes diversion. The facilities for that would be the Fryingpan collection and diversion system, the Aspen Reservoir, enlargement of Twin Lakes Reservoir, the Snowden diversion canal for importation of water for storage in Twin Lakes, and the purposes are irrigation only.

The water supply would amount to increased headgate supply for irrigation and includes usable return flow, the amount 99,200 acre-feet. The capital cost for construction would be $46 million, and the benefit-cost ratio would be slightly more than 1 to 1, according to the method used in the Bureau of Reclamation.

But here again we have a repayment infeasibility. Irrigation repayment will require over 245 years to accomplish, and that is about the best picturization of the analysis pursued according to those instructions. In other words, without the power features there can be no development on either the east slope or the west slope of the Continental Divide.

Senator MILLIKIN. The answer is that you have to take them all together.

Mr. POWELL. You have to take them all together, sir.

Senator MILLIKIN. Or you do not have a project.

Mr. POWELL. That is right, sir.

Now we come to the revenues. Senator Jackson requested this analysis. It appears in my statement which I have filed.

Senator MILLIKIN. Before you move to your next point, is there any other way to approach the subject which would produce a different result than you have just told us about? Is there any other way that this could be done?

Mr. POWELL. Senator, that was my chief concern for the first 3 years of my tenure in office with the Bureau of Reclamation in the city of Pueblo, beginning in 1944. I pursued that conscientiously and consistently until I exhausted all possibilities. I can state from probably 40 or 45 years of irrigation experience that I know there is no feasible solution from the native waters of the Arkansas River.

May I go on to the next?

Senator MILLIKIN. Yes.

Mr. POWELL. As I said Senator Jackson this morning requested the detail regarding the revenue from the project. I will read from the 11th page of my statement.

From the irrigation and district, project water at $5.40, $304,180 annually. That is the average figure. Twin Lakes service for storage of 12 500 acre-feet of water at $3 per acre-foot, $37,500.

Senator MILLIKIN. What makes you think you will get $3 for that?

Mr. POWELL. We have conducted a survey of the ability of the farmer of the Arkansas Valley on this land to make repayment. We have here two dirt farmers who participated in that survey. They will testify regarding the feasibility of collecting $5.40 per acre-foot for the project water and as we have used that $5.40 as a base figure for the value of this water we have taken from that $5.40 the expenditure which the Twin Lakes Canal and Reservoir have made in their own behalf for the expense of importing this water to the Twin Lakes Reservoir.

We have deducted their costs from this fair charge, and the result is $3. That was our method of determination. So we start with the fair price. We take the money from that which they have expended and come out with the figure of $3.

Senator MILLIKIN. The farmers here will testify that that is an acceptable figure?

Mr. POWELL. Yes, sir.

The next item is reregulation of winter water, 74,000 acre-feet at $2.25. That amounts to $166,500 per year.

The next item is the district tax. The valuation shown here is $198 million, at 1 mill levy minus 10 percent for administration, the net figure is $179,475, making a subtotal from the district and the farmers of $688,655. From that we take the yearly operation maintenance and replacement charge of $67,000, leaving a net toward the payment for the project yearly of $622,000.

If you multiply that sum by 70 years you will come out with the figure of about $43 million, which the farmers and the district under this plan which Secretary Aandahl outlined this morning will pay toward the project to pay for construction costs allocated to them.

Senator MILLIKIN. The carrying charge, what you call the carrying charge, includes current service costs plus something toward the capital costs, is that right?

Mr. POWELL. Yes, sir; a very considerable amount toward capital. I will explain that in more detail from a chart later. If you do not mind I will go on with the power now.

Power, net: This is the amount of power deliverable, after losses, at the load centers—370 million kilowatt-hours. That is the net figure from that 400 million kilowatt-hours per year which I mentioned a minute ago and which was mentioned this morning. At 5½ mills that comes to $2,035,000.

The secondary power deliverable, 87,200,000 kilowatt-hours. At 3½ mills that amounts to $340,200. A total from power of $2,375,200. From that will be subtracted the operation, maintenance, and replacement to keep the system in 100-percent condition for the entire period of use, $870,800, and the net power revenues, rounded out, are $1,504,400 each year.

The next item on the revenue schedule is the municipal and industrial water. We have municipal supplies, 38,000 acre-feet at various rates. I can give those in more detail if you desire, but at various rates that comes to $1,476,410.

The Colorado Fuel & Iron Co. desire 10,000 acre-feet of storage capacity at the site, which they own. They contemplated the enlargement of their present reservoir, and if we use their site it is only right and proper that they obtain this space for the storage of their own water. As a service and a charge we have $2 an acre-foot in our payout schedule, which amounts on 4,000 acre-feet to $8,000 a year. That figure is subject to negotiation, and I think that is conservatively low. However, it is based on an estimate which we made of their costs of enlarging their reservoir.

That gives the sum of those two figures as $1,484,410. From this again we take the operation, maintenance, and replacement of $420,220, and we have net municipal water revenues of $1,064,190.

Adding these three figures, $622,000 from the irrigation water, $1,504,400 from the power revenues, and $1,064,190 from the municipal water revenues, we have a net project revenue of $3,190,590.

Senator MILLIKIN. What makes you think you will have a market for your electricity?

Mr. POWELL. We have an offer from the two largest companies in the State of Colorado requesting that the power which this project indicates will be produced be sold to them as purchasers. I think that Mr. Patterson will go further into the details of that when he offers his testimony.

I think that constitutes a valid indication of our ready market. They have proposed that they be allowed to buy the power.

Senator MILLIKIN. That is an expanding market for power out there, is it not?

Mr. POWELL. Yes, sir; it is expanding very rapidly. I think the expansion rate is between 8 and 10 percent a year.

My next item: As an indication of the power market we have here a chart showing the population growth. This is the total population beginning in the year 1880, and the upward scale is in hundreds of thousands, 100,000, 200,000, 300,000, 400,000, and 500,000. In 1940 the total population was close to 300,000 in the valley, and this indicates that in the year 1975 the population will exceed 400,000. Since 1940 this curve has begun to point upward, and this is a valid indication of our growth because it is made by an unbiased source, which is the bureau of business research, of the University of Colorado, and the date is May 1953.

Senator MILLIKIN. Is that roughly about a fourth of the population of the whole State at the present time?

Mr. POWELL. It is slightly less than a fourth, Senator Millikin.

Senator MILLIKIN. What is the figure on that chart? What do we have now, about 1,300,000 or 1,400,000 in the State? What percentage is this district of the whole figure?

Mr. DUCY. About 23 percent of the total population.

Mr. POWELL. This chart represents the operation of the project fiscally. The figures shown on the bottom are years, running from zero to 100. It indicates that under the plan suggested by Secretary Aandahl this morning the project would be paid out under a modified Collbran formula in 69 years, with a small amount in the 70th year.

Senator MILLIKIN. What will be the state of the facilities at the end of 70 years? What will be the state of the reservoirs, what will be the state of the generating equipment and ditches and so forth?

Mr. POWELL. The mountain reservoirs will have a life almost limited at the end of the period. The Pueblo Reservoir will have filled up the space for sediment allocated, which amounts to 93,000 acre-feet. That does not limit the life of the Pueblo Reservoir, however. By depressing increments that life would be useful for prabably 250 or 300 years beyond that first 100 years. But there is sediment provided in the Pueblo Reservoir for a 100-year period. So the project would be unimpaired and in 100 percent condition for operation at the end of that time.

Senator MILLIKIN. Do the current charges take care of the current expense of maintaining the project?

Mr. POWELL. That is right, sir.

Senator MILLIKIN. In good shape?

Mr. POWELL. In good shape.

We have the zero line at this point on the chart. Below that zero line is a red area which indicates the amount which would go yearly for operation, maintenance, and repair of the system. That begins with the installation of the units and extends indefinitely.

Senator MILLIKIN. After what period do you have the unbroken line there? Is that 10 years?

Mr. POWELL. Thirteen years.

Senator MILLIKIN. After 13 years you have finished everything and you are then on a steady line?

Mr. POWELL. On a steady line, sir. The first repayable function above this line is the power investment, and the amount of the power investment, including interest during construction, amounts to $43,275,000. That is the purple area. Below that purple area and above the red, the O. M. & R. area, is representation of the interest which will be paid at the rate of 2½ percent on this capital investment. This capital investment will be paid out in 50 years after the installation of the last unit, and as you know, the interest amounts to approximately $1 million per year at the 10th year, and at the end of the pay period becomes zero.

The total of the interest and capital repayment at all times——

Senator MILLIKIN. What is that pink right above the yellow?

Mr. POWELL. This? That is the area representing the amount paid on retirement of the capital investment in the plant and the interest during the period of construction. It is power, sir.

Senator MILLIKIN. To repay the plant out of your power charge?

Mr. POWELL. That is right, sir.

Senator MILLIKIN. The Government is paid interest on the investment?

Mr. POWELL. That is right, sir.

Senator MILLIKIN. It goes into the Treasury?

Mr. POWELL. It goes into the Treasury. This yellow area represents money going to the Treasury.

Above that we have the amount paid by the conservation districts——

Senator MILLIKIN. Stop just a moment at that point. Has anyone criticized your estimates of how fast you can pay out that power? In other words, has anyone criticized your proposed charge?

Mr. POWELL. No, sir. The charge has not been criticized. It is indicated by the price of power in the area that the price is very reasonable and that there is a ready market at the price indicated in the project report.

Above this power investment illustration we have in blue the area representing the payments by the conservation districts and, as I stated in the revenue treatment the total yearly is $622,000, and in the payout period of approximately 70 percent it will amount to, this repayment on construction cost, $42,918,000.

Directly above this area, representing the repayment by the conservation district, we have the repayment with interest of the investment in the plant for the purification, production, and delivery of the municipal and industrial water.

Senator MILLIKIN. What kind of plant will that be? How will you render the water palatable?

Mr. POWELL. The water will be rendered palatable by a purification plant located at the Pueblo Reservoir with a capacity of 55,500,000 gallons per day.

Senator MILLIKIN. What kind of system will it be? How will they do it? What are the chemical or mechanical means of doing that?

Mr. POWELL. It would consist of a sediment clarification bay, and then mechanical filters for the treatment of the water, and chlorination, primary chlorination, with secondary chlorination occurring at the distant towns.

Senator MILLIKIN. That will soften the water up?

Mr. POWELL. It will soften the water some, but the water in the Pueblo Reservoir will probably never exceed 8 or 9 grains of hardness, and I have some recent information from a very reliable water supply firm that the quality of the water in the Pueblo Reservoir will be even better than that indicated in the report.

Senator MILLIKIN. That is the water that you also pipe down the valley to those towns which wish it?

Mr. POWELL. To those towns. The towns of the valley will receive the same quality water which the city of Pueblo will receive from this system.

Senator MILLIKIN. That will be a more economical operation than to have a plant at every one of those towns?

Mr. POWELL. It will be much more economical, Senator. It combines the operation in one place, the pumping in one place, and from the reservoir of the system near Pueblo the water will flow by gravity to the city of Pueblo and the towns of the valley. The reservoir is high enough to eliminate pumping in the city of Pueblo.

As I said, this municipal water investment will be retired in 50 years after the installation of the last unit. This yellow represents the capital cost, including the interest during construction of this municipal plant. It is $33,908,000. The interest on the plant which will go to the Treasury, indicated in yellow, is $28,508,237, and this is at the rate of 2½ percent or the going rate to the Federal Government of long-time money.

Senator MILLIKIN. Do you have precedents for combining municipal water operations with other operations in the Bureau of Reclamation?

Mr. POWELL. Very much so. The Los Angeles aqueduct, which supplies the city of Los Angeles, is dependent directly upon a reclama-

tion development at Boulder City. The Provo project in Utah develops municipal water. The city of San Diego in turn gets its water from the Colorado River through a development.

Senator MILLIKIN. Do you have precedents for water purification in connection with the distribution of municipal water?

Mr. POWELL. I can't answer that question.

Senator MILLIKIN. What do you say about that?

Mr. TOMLINSON. Yes, sir. There are one or two small ones that I can think of. I believe Lewiston Orchards is one. Generally we do not build the purification facilities.

Senator MILLIKIN. Is there any objection to it so far as the terms of the law are concerned?

Mr. TOMLINSON. No, sir; not so far as the terms of the law are concerned. The report states that the Secretary would not propose to build these works until he was assured by the municipalities involved in the project that the work was beyond their capabilities, and he was satisfied that that was the case.

Mr. POWELL. You will notice that the repayment for the irrigational allocation, the area in blue, extends to the 69th year with a very small fraction in the 70th year from the beginning of the operation of the project.

After the municipal water has paid for the structures peculiar to them and their allocation of the joint costs, they are charged over a period of about 6 years, in the interest of the irrigation allocation, the amount of $6,738,000 which is the net revenue from the municipal water system. This goes to help pay for the irrigation allocation. When the power has completed the payment of its structure, the net revenues are used for a period of 13 years, and in the amount of $25,472,000 toward the repayment to the Federal Treasury of the construction costs of the irrigation features of the project, or the irrigation allocation.

Beyond that 70th year there is from the power net revenues of something over a million and a half dollars. This would be returned presumably to the Federal Treasury.

Senator MILLIKIN. Is it your purpose to discuss the nonreimbursable features of the project?

Mr. POWELL. I have not touched on the flood-control features. I will, however.

The allocation to flood control is $20,341,000. It is a non-reimbursable allocation and is based on benefits which the valley between the Pueblo Reservoir and John Martin Reservoir below Las Animas, in the valley and off the river will receive by the prevention of something over $500,000 of flood damages annually average each year.

Senator MILLIKIN. The flood-control features of the John Martin Dam take care of your downstream below the John Martin Dam?

Mr. POWELL. That is right; below the John Martin Dam.

Senator MILLIKIN. What is the flood situation from the headwaters to Pueblo?

Mr. POWERS. From the headwaters to Pueblo there are some flood damages between Canyon City and Pueblo. They accrue mostly from sidestreams. The Corps of Engineers are doing some investigation of that damage and making plans for the prevention of those damages, principally to the city of Florence and the city of Portland.

Senator MILLIKIN. Where does the flood damage occur below Pueblo?

Mr. POWELL. Below Pueblo the flood damage occurs on the lands in the bottoms and also these damages are from interruptions of irrigation service to the land being irrigated by structures having diversion dams and headgates on the river.

Senator MILLIKIN. This figure of 500,000 plus which you gave us of average annual flood damage takes in what part of the river?

Mr. POWELL. The part of the river between the Pueblo Dam 7 miles above Pueblo and the John Martin Dam immediately below the city of Las Animas and below the mouth of the Purgatoire River.

Senator MILLIKIN. Is there not some damage above the city of Pueblo? I thought you had about $800,000 or $900,000 a year total flood damage to the Arkansas River.

Mr. POWELL. There is eight or nine hundred thousand damage below Pueblo, but some of that is attributable to sidestreams which will not be regulated by the Pueblo Reservoir.

In addition to this damage there have been serious damages to the city of Pueblo, but in the eyes of the Corps of Engineers the works which they have worked on lately are adequate to take care of the damages to the city of Pueblo. However——

Senator MILLIKIN. Is there not substantial flood damage above the city of Pueblo on the Arkansas River?

Mr. POWELL. Between Pueblo and the reservoir?

Senator MILLIKIN. Between Pueblo and the headwaters.

Mr. POWELL. There are substantial damages in there but I cannot tell you, Senator, what they amount to annually. I do not have that Army report.

Senator MILLIKIN. If there is flood damage on the Arkansas River above Pueblo, these regulating reservoirs will mitigate that damage, will they not?

Mr. POWELL. They will, sir.

Senator MILLIKIN. The reason I am questioning you, I have seen the figure some place which runs in my mind around $900,000 a year of flood damage that will be substantially mitigated by this project.

Mr. POWELL. That is right, sir; except of that total something over $500,000 is credited to the Pueblo Reservoir.

The other nonreimbursable allocation, Senator Millikin, is for works peculiar to the collection of water in the interest of fishing on the Roaring Fork River above the town of Aspen. It is planned to take from the south fork of Hunter Creek, which flows into the Roaring Fork at Aspen, about 100 second-feet of water to take this through our system, store it in our system, and deliver it to the Twin Lakes Reservoir & Canal Co. in lieu of water which they would leave in the Roaring Fort River at times of low flows for the purpose of protecting the fish life in the Roaring Fork River.

Senator MILLIKIN. Out of what river are you getting the water that you will import to the eastern slope?

Mr. POWELL. Out of the Hunter Creek.

Senator MILLIKIN. All the water will come out of Hunter Creek?

Mr. POWELL. Not all, sir, not strictly. We are under obligation, if the south fork of Hunter Creek—and this is so shown in the agreement in this document 106—that that responsibility is jointly shared

between the south fork of Hunter Creek and Lime Creek, which is on the northern end of that collection system on the map before you.

Senator MILLIKIN. Hunter Creek is a tributary of what?

Mr. POWELL. Of the Roaring Fork River.

Senator MILLIKIN. Where does the Fryingpan come in?

Mr. POWELL. The Fryingpan comes into the Roaring Fork about 20 miles below the town of Aspen and also about 20 miles above the junction of the Roaring Fork with the Colorado River at Glenwood Springs.

Senator MILLIKIN. Why do we call it the Fryingpan?

Mr. POWELL. Why do we call it the Fryingpan? I do not have that knowledge.

Senator MILLIKIN. I do not mean why they named the river Fryingpan, but why do we call this the Fryingpan project?

Mr. POWELL. Because it is concerned with the importation of water from the Fryingpan River to the Arkansas River. The Arkansas River drains into the Gulf of Mexico. The Fryingpan drains into the Colorado and in turn drains into the Pacific. Does that make it clear?

I believe that is all, unless I have overlooked some item.

I thank you.

Senator MILLIKIN. Thank you very much, Mr. Powell.

(Mr. Powell's prepared paper follows:)

STATEMENT BY BEN F. POWELL, AREA ENGINEER, UPPER ARKANSAS RIVER AREA, PUEBLO, COLO., ON THE FRYINGPAN-ARKANSAS PROJECT, JUNE 1953

The Fryingpan-Arkansas project is a potential multiple-purpose self-contained water development located entirely within the State of Colorado. Because transmountain diversion is involved, the project has features on both the west and east sides of the Continental Divide. Principal purposes that would be served are: Irrigation, municipal water, hydroelectric power, flood control, and sediment control. Recreation and fish and wildlife benefits would also accrue.

An annual average of about 185,000 acre-feet of supplemental irrigation water would be provided at canal headgates in the Arkansas Valley. This amount includes transmountain diversion of 69,200 acre-feet of project water from tributaries of the Fryingpan and Roaring Fork Rivers, an additional 14,900 acre-feet of water which would be imported annually by the Twin Lakes Co., conservation of flood flows in the Arkansas River, and regulation of winter flows. Reuse or return flows would, in effect, expand that water supply. This water would be available to the 322,000 acres of presently irrigated lands which now suffer an average annual shortage of water estimated at 35 percent of headgate diversion requirements. With the additional supply, the shortage of water would be entirely eliminated in 17 years out of 34, and the average shortage would be reduced to about 16 percent.

The amount of water now available for the 322,000 acres of irrigated lands varies considerably from year to year. Water shortages have occurred every year ranging from as high as 78 percent to as low as 3 percent of crop requirements. Seldom is the supply adequate for full crop production. The base flow of every stream in the valley is overappropriated. Enhancement of the irrigation water supply depends upon regulation of existing supplies for more efficient use, storage capacity for the conservation of excess flood flows, reservoir space for holdover storage, and new water supplies for which the only source is transmountain diversion from the Colorado River watershed.

Present municipal water supplies are inadequate for continued population and industrial growth. In the Arkansas Valley towns the supplies are generally poor because of excessive hardness. The project will provide about 15,000 acre-feet of municipal water annually to supplement the supplies of Colorado Springs, Pueblo, and at least 8 smaller communities in the Arkansas Valley where additional quantity and better quality water are urgently needed.

En route to its ultimate users, the imported and regulated water would generate about 505,000,000 kilowatt-hours of electric energy annually in hydroelectric plants. There is a ready and ever growing market for this energy. It is needed

to meet the requirements of increasing uses of electric energy on farms and in cities and of mining and industrial expansion.

Flood protection would be provided by the terminal eastern-slope reservoir which would eliminate about 66 percent of the probable annual flood damages in the valley between the Pueblo and John Martin Reservoirs.

Sediment control and the preservation and propagation of fish and wildlife in certain areas would also be important and valuable contributions of the project.

PROJECT PLAN

The preceding purposes would be accomplished through the construction of: (*a*) A system of about 50 miles of canals and tunnels on the western slope for the collection and movement of water from Hunter Creek and tributaries of the Fryingpan River; (*b*) Aspen Reservoir, with an active capacity of 28,000 acre-feet near the town of Aspen on the western slope to provide replacement water and water for future western-slope uses; (*c*) the 6-mile Fryingpan-Arkansas transmountain diversion tunnel; (*d*) enlargement of the existing Sugar Loaf and Twin Lakes Reservoirs and the construction of Pueblo Reservoir for a total eastern-slope storage capacity of 777,000 acre-feet; (*e*) diversion facilities to pick up Arkansas River flows; (*f*) a project power system comprising 60 miles of canals, 7 powerplants having an installed capacity of 104,800 kilowatts, 7 switchyards, 9 substations, and necessary transmission lines; and (*g*) specific municipal water supply facilities for furnishing additional municipal water to Colorado Springs, Pueblo, Manzanola, Rocky Ford, La Junta, Las Animas, Lamar, Crowley, Wiley, and Eads. The project plan provides for the construction of the specific municipal supply works by the United States only after it is proved that construction by the communities themselves is infeasible.

The present plan for the Fying-Arkansas project is the culmination of many years of effort by residents of the Arkansas Valley.

The need for supplemental irrigation and municipal water was demonstrated in the 1920's. Various private plans for the importation of water were started, some were actually developed, but no overall plan could be devised because of the numerous complex problems involved. The severe drought of the 1930's demonstrated the vulnerability of the Arkansas Valley and the urgent need for action. In 1936 the Bureau of Reclamation initiated a comprehensive survey of the Upper Arkansas River Basin to appraise needs and possible methods of alleviation. Early studies envisioned the importation of a relatively large quantity of Colorado River water into the Upper Arkansas Basin. However, in inventory of resources, needs, and potential uses of water on the western slope had not then been made—in fact it has not been completed to this date. Consequently, it was deemed expedient to develop a self-contained plan which would divert only a minimum amount of critically needed water that was assuredly beyond the requirements of the western slope and yet have a project that could fit into a much larger development should such expansion ever come to pass. The present plan is the result.

The project has been designed to obtain maximum values for each dollar of investment. This has been accomplished by designing features for multiple uses and planning for coordinated and integrated operations. The interrelationship of operations is demonstrated by the need for interconnection of the hydroelectric plants. These plant interconnections will enable the operation of reservoirs in such a manner as to insure maximum generation consistent with optimum water supply for irrigation. Interconnections with adjacent power systems will also be required to assure an uninterrupted flow of energy to the power markets. Only the municipal water supply phase of the project is susceptible of complete separation without jeopardizing the other purposes.

In the event that construction of specific municipal water facilities should be deferred, the water can be used for irrigation. The other phases of the project—irrigation, power, flood control, sediment control—are so closely tied together in features and operation that elimination of all or parts of any one function would have a profound effect upon the others. This project is a true multiple-purpose development.

Prior to completion of the planning report by the Bureau of Reclamation, a State policy and review committee was appointed by the Colorado Water Conservation Board to study the proposed project plan. The committee was composed of representatives of the conservation board, the Colorado Game and Fish Commission, western Colorado, the Arkansas Valley, and the city of Colorado Springs. The committee approved the proposed diversion and recommended

certain principles of project operation which have been made a part of Senate Document No. 106, 82d Congress, 2d session.

The planning report has been officially reviewed by States in the Colorado River Basin, by Kansas and by affected Federal agencies. Colorado approved the proposed development conditioned upon compliance with the operating principles mentioned above and upon changing the name to the Fryingpan-Arkansas project. The States of Kansas, Arizona, California, Utah, and Wyoming have no objection to the authorization and construction of the project. Views and comments of the various Federal agencies are generally favorable; some agencies recommended refinements or offered suggestions all of which have been considered in the revised report. Concerned Federal field agencies offered comments on the preliminary draft of the report which were considered in completing the project report.

### COSTS AND BENEFITS

Estimated project construction costs have been adjusted upward for price changes from the $147,440,000 based upon October 1949 prices shown in the basic report to $172,898,000 based upon January 1953 prices. Estimated annual operation, maintenance, and replacement costs are $1,313,000—a sum sufficient to operate and sustain the project facilities.

Benefits will accrue to the functions of irrigation, municipal and industrial water supply, power, flood control, fish and wildlife conservation and propagation, and sediment retention. Irrigation aspects include supplemental water supplies, conservation and use of flood flows, reregulation and more timely use of water now used for winter irrigation, and reuse of return flows from both irrigation and municipal water supplies.

Annual irrigation benefits have been evaluated in two categories—direct benefits in the form of increased net farm income amounting to $1,598,000 annually and indirect benefits in the form of increased income stemming from the marketing and processing of farm commodities and from increased purchases by the irrigation farmers. These indirect benefits are estimated at $2,757,000 annually. The irrigation benefits are based upon a prospective agricultural price index of 215 and parity at 100 percent.

Municipal water supply benefits total $1,662,000 annually and are derived from analysis of the costs of developing and operating an alternative single-purpose municipal water supply system.

Annual power benefits of $2,702,000 represent the value of project power in the area to be served.

Flood control benefits in the reach of the Arkansas River between Pueblo and John Martin Reservoir were evaluated by the Corps of Engineers and total $598,000 annually on the basis of prospective future prices. (Engineering News Record index of 180 when 1939 equals 100.)

Fish and wildlife benefits have not been evaluated in an annual amount. However, the Game and Fish Commission of the State of Colorado and the Fish and Wildlife Service concur in the conclusion that incremental costs of western slope features of $2,830,000 are supportable for the mitigation of existing and future losses occurring from present diversions of water.

Annual sediment retention benefits of $141,000 are of relatively small magnitude. They represent savings of annual costs of cleaning and maintaining existing canals and diversion works due to less sediment deposition and the prolongation of the useful life of existing downstream reservoirs.

The ratio of total benefits to total annual project costs is 1.48:1.00. It is significant that the sum of the direct benefits alone is sufficient to support all project costs.

COST ALLOCATION

The total estimate project construction costs have been allocated to all functions served except sediment control. The allocation to fish and wildlife is limited to the incremental costs of $2,830,000 for features on the western slope that will mitigate losses. Allocations to the remaining purposes have been made by the widely used alternative justifiable expenditure method. Its application results in allocations of costs to each function which cover the cost of including the function in the multiple-purpose project and which share equitably in both the joint costs and in the savings arising in the combination of multiple purposes. The allocations follow:

| *Function* | *Allocation* |
|---|---|
| Irrigation | $75, 128, 000 |
| Power | 41, 945, 000 |
| Municipal water | 32, 654, 000 |
| Total reimbursable | 149, 727, 000 |
| Flood control | 20, 341, 000 |
| Fish and wildlife | 2, 830, 000 |
| Total nonreimbursable | 23, 171, 000 |
| Total construction cost | 172, 898, 000 |

REVENUES

The plan of project operation calls for the formation under provisions of Colorado law of a water-conservancy district which would contract with the Government for the payment of project services performed in the collection, storage, regulation, and release of water. Supplemental irrigation water at specified rates would be released to the district at reservoir outlets, or possibly along the river, depending upon circumstances. The basic report proposed a rate of $3.60 per acre-foot at or above the Pueblo Reservoir. This rate has been determined to be within the payment capacity of the water users on the basis of agricultural prices prevailing during the period 1939–44 when the agricultural price index averaged 144. It is proposed that the contract with the conservancy district will contain provisions for varying annual water charges in accordance with agricultural prices. That provision together with the assumption that the future agricultural price index will be 215 rather than 144 will result in adjustment of the basic rate per acre-foot of water from $3.60 to $5.40.

Under contractual arrangements the conservancy district would assume responsibility for the delivery of irrigation water. This district or possibly another entity would contract with the Government for Federal construction of the specific municipal water system, for district operation and maintenance of that system, and for delivery of water from the joint water supply system. There will also be other sources of annual revenue; proceeds from an ad valorem tax levied by the conservancy district on taxable property benefited by the project, a service charge for the storage of the additional Twin Lakes irrigation water, service charges for the reregulation of water supplies now used for winter irrigation, and a service charge for project storage of the additional water of the Colorado Fuel & Iron Corp. which is included with municipal supplies for payout analysis. Estimated annual project revenues for irrigation, power, and municipal and industrial water are summarized in the table on the following page.

PAYOUT ANALYSIS

*Revenues*

| *Function and source of revenue* | *Annual amount, payout analysis* |
|---|---|
| Irrigation and district: | |
| Project water (56,700 acre-feet, at $5.40) | $306, 180 |
| Twin Lakes service (12,500 acre-feet, at $3) | 37, 500 |
| Regulation of winter water (74,000 acre-feet, at $2.25) | 166, 500 |
| District tax ($198,306,000, at 1 mill minus 10 percent) | 178, 475 |
| Subtotal | 688, 655 |
| Less operation, maintenance, and replacement | 67, 000 |
| Net irrigation revenues (rounded) | 622, 000 |
| Power: | |
| 370,000,000 kilowatt-hours, at 5.5 mills | 2, 035, 000 |
| 97,200,000 kilowatt-hours, at 3.5 mills | 340, 200 |
| Subtotal | 2, 375, 200 |
| Less operation, maintenance, and replacement | 870, 800 |
| Net power revenues (rounded) | 1, 504, 400 |
| Municipal and industrial water supply: | |
| Municipal supplies (38,000 acre-feet, at various rates) | 1, 476, 410 |
| Colorado Fuel & Iron Corp. (4,000 acre-feet, at $2) | 8, 000 |
| Subtotal | 1, 484, 410 |
| Less operation, maintenance, and replacement | 420, 220 |
| Net municipal water revenues (rounded) | 1, 064, 190 |
| Total annual net project revenue | 3, 190, 590 |

The revised report shows a possible repayment procedure which would provide project payment under the following assumption: interest during construction is added as a cost to the allocations of both power and municipal water supply; also, the interest rate of 2½ percent is applied in the amortization of the power and municipal water investments. On this basis, the power investment could be retired in 44 years after the last unit is completed and the municipal water investment could be repaid in 50 years after the last facility is completed. None of the interest components would be used to assist in payment of the irrigation investment. Instead, the revenues from the irrigation beneficiaries would be applied for a period of 69 years, full net power revenues would be applied against irrigation costs beginning in the 53d year of study and extending through the 69th year and full municipal water supply revenues would be applied beginning in the 63d year and ending in the 69th year. A small portion of net power revenues in the 70th year would be necessary to complete the repayment of the irrigation investment.

After retirement of investments the continuing annual net power revenues would accrue to the United States Treasury throughout the remaining useful life of the project works.

The Fryingpan-Arkansas project is feasible from an engineering standpoint, its services and products are vitally needed in the area to be served, and its revenues will return all reimbursable costs within a reasonable period of years.

Senator MILLIKIN. We will hear next Mr. Dan Hunter, president of the Southwestern Colorado Water Conservation District.

Mr. Hunter, it is a great thing for you to take the trouble to come down here. We are mighty glad to have your testimony. Mr. Hunter is a highly respected citizen of Colorado and knows his business.

## STATEMENT OF DAN B. HUNTER, PRESIDENT, SOUTHWESTERN CONSERVATION DISTRICT, DOVE CREEK, COLO.

Mr. HUNTER. My name is Dan B. Hunter, I am a member of the Colorado Water Conservation Board. I am the president of the Southwestern Water Conservation District. I represent the State of Colorado in an advisory capacity only with the Federal Rivers and Harbors Commission. This recognition was bestowed upon me by our Congressman, Byron G. Rogers, of Denver, Colo.

I wish to state in the beginning, Senator Millikin, as you well know, that I appear before this committee with somewhat a spirit of nervousness because of the simple fact that I am not an expert; I am only a farmer.

My reason for appearing here at this time is in order to verify the facts that have taken place in the development of what has occurred in the State of Colorado Water Conservation Board and also with the Southwestern Water Conservation District and the Colorado River Conservation District.

The Colorado State Water Board appointed a committee to make an investigation of what is known as the Fryingpan-Arkansas diversion project. This committee was comprised of some of the best engineers we have in the State of Colorado and some of the most eminent attorneys within that State. After the 30 months of investigation they submitted a report to the Colorado State Conservation Water Board and that report was presented to the members of that organization, which, as has already been stated, is comprised of nine individuals appointed by the Governor of the State.

We studied their report, went over it very carefully, and after due consideration we adopted that report and as such decided in the best interests of the State of Colorado and for the good of the greatest number of people within the State that we would accept and recommend to this august assembly that they give their authorization to the project.

This same report was presented to the Southwestern Water Conservation District, of which I happen to be the president, and have been for the past 12 years, when it was inaugurated as a matter of legislative enactment by the State of Colorado for the purpose of conserving and developing the best interests of the waters of the Colorado River.

As I stated before, the Southwestern Water Conservation District Board approved the Fryingpan-Arkansas project. Also the State Conservation Water Board of the State of Colorado gave its approval, and the other district comprising from Grand Junction, Colo., north and west and east of the State of Colorado, 16 counties have given their O. K. to this project.

I do wish it to be definitely stated as a matter of record in appearing before this assembly and agreeing to the transmountain diversion of the 69,200 acre-feet of water from the Fryingpan and Roaring Fork to the Arkansas River in nowise would commit me as to what my opinion might be on future transmountain diversion of waters from the western to the eastern slope. Naturally, Senator Millikin, in my geographical location and having resided on the western slope of Colorado for the past 35 years and being only human, it would be natural for me from a personal viewpoint to oppose any transmountain

diversion of our waters from the western slope to the eastern slope unless there was a dire emergency existing. I am free to speak for the Southwestern Water Conservation District.

We debated this question very seriously for an entire day, and we reached the conclusion that there was an emergency existing in the Arkansas Valley and among our neighbors who reside east of the Rocky Mountains, and as such we felt this diversion of 69,200 acre-feet of water would not materially affect the delivery of the 75 million acre-feet of water which was allocated to the people of the upper basin States to make this delivery to the point on the Colorado River known as Lee Ferry for a period of 10 years.

This being an infinitesimal amount of water, we reached the conclusion that the people who reside in the Arkansas Valley were in dire need of this water to supplement their lands and also to supply a direful need for water in the cities of Colorado Springs and Pueblo and many other towns lying south of Pueblo to the Kansas State line.

As a result, the South Western Water Conservation District which I represent went on record as being perfectly willing to request the Interior and Insular Affairs Committee of the Senate of the United States to grant the authorization of this project.

In my opinion, Senator Millikin, the two most important natural resources that the people of the world have are light and water. You are mindful of the fact that the first passage we have in the Book from which we take our guidance states:

> In the beginning God created the heaven and the earth. And the earth was without form, and void; and darkness was on the face of the deep. * * * God said, Let there be light: and there was light.

In my opinion, if light had not been the most important thing to the human race it would not have been the first recorded words we have that God ever spoke.

Secondly, I am reminded of the fact that in the second chapter of the Book of Genesis we read that after God had formed man from the dust of the earth he caused a deep sleep to fall upon Adam and removed from him a rib and he created Eve as his helpmeet. The record states that Adam and Eve were placed in the Garden of Eden, and why? The record states because there was the confluence of three rivers made this garden, and in order that Adam and Eve might enjoy all the pleasures and blandishments of home life. The record states because there was water with which to irrigate the land.

My principle and my philosophy is that man from the very beginning of time has been an irrigator. Even though the first home of man was made and created by the immaculate finger of our God, we find he placed this garden where there was water in order that it might irrigate the land.

Further on, a few thousand years passed, and we find this same record reading throughout the annals of time, that man had become so wicked and evil the all-wise God decided to destroy him from the face of the earth. We find that he commanded a man by the name of Noah to construct an ark in which he might be able to escape the dilemma of a great flood. Noah and his wife and three sons and their wives were enclosed within the ark. After 30 days and nights of flood we find the ark resting upon Mount Ararat. Noah descends. He goes down to the great valleys of the Armenian Plains, and there he plants the vineyard near the waters whereby he too might use irrigation.

Using the words of my very eminent friend and attorney, Jean Breitenstein, I heard him say last summer that Noah was a wonderful man on irrigation, but knew very little concerning flood control. [Laughter].

Those of us who live on the western slope feel that we too need water. I am of the opinion, however, that there will be some, perhaps, who will appear before this committee who will object to this transmountain diversion. I am not here either to sustain their objections or to dissent from them. That is their privilege. On the other hand, the statement was made before the House hearings last week that it would open the door for other transmountain diversion irrigation projects. But, Senator Millikin, may I remind you of this fact: As a matter of record we have two resolutions that were presented to the Colorado State Water Board, and one of those resolutions was prepared by the Southwestern Water Conservation District and was prepared by me. Those resolutions were unanimously adopted.

I remind you, Senator, in my opinion instead of opening the door that the camel might poke his head in and not be disturbed by the boisterous sands and the winds blowing over the deserts of Sahara, on the other hand, it locks that door to such an extent that we people who reside on the western slope have the protection that no further transmountain diversion projects will take place until such time as this survey has been completely made and we know as a certainty how much water we will need for our future portential needs on the western slope.

In conclusion, Senator Millikin, I wish to ask you gentlemen to present unto us this magical wand, this wand of authorization, in order that we might give it unto our friends and neighbors who reside on the eastern slope of Colorado and that they in turn can present it unto their people. As a result, when they receive this wand of authorization for the Fryingpan project, in my opinion you will find it will enhearten the lives of a grateful people who live beyond the divide in which I live.

I thank you. I wish to present this statement.

Senator MILLIKIN. It will be included in full in the record. Mr. Hunter, we thank you very much for coming.

(Mr. Hunter's prepared paper follows:)

STATEMENT IN SUPPORT OF THE FRYINGPAN-ARKANSAS PROJECT BY DAN B. HUNTER

Mr. Chairman, my name is Dan B. Hunter; my address is Dove Creek, Colo. I am a member of the Colorado State Water Conservation Board, president of the Southwestern Conservation District, which comprises eight counties lying within the great San Juan Basin. I also represent in an advisory capacity the State of Colorado on the National Rivers and Harbors Congress.

I have resided in Colorado for 35 years. In appearing before your august assembly I am making no recommendations with respect to the availability of water for large transmountain diversions from the western to the eastern slope of Colorado. However, I do recognize that there is urgent need in Colorado for supplemented water supplies in the Arkansas Valley. This need is particularly true concerning domestic and municipal purposes. I do not wish that any statement which I may make to be construed to mean that I am committing myself as agreeing to the second phase of what is known as the Gunnison-Arkansas project or the potential Blue-South Platte project. I do favor the Fryingpan-Arkansas project as an independent development.

In my opinion this transmountain Fryingpan-Arkansas project will not deplete the streamflow of the Colorado River to an extent that will impair the right of

delivery of 75 million acre-feet of water at a point on the river, known and designated as "Lee Ferry" through a 10-year period as called for under the 1922 Colorado River compact.

I am aware of the fact that this compact allocates the bottom half of the flow of the Colorado River to the 3 lower basin States, while the 4 upper basin States must be contented to put to use the erratic flow of the stream. This being true, I opine that the Fryingpan-Arkansas project will in a measure aid and assist in regulating the peaks and valleys of the Colorado River.

We are all aware that a considerable storage capacity will be necessary in order to carry water over from wet years to dry years if the delivery of water to Lee Ferry under the 1922 compact is consummated, and the commitments to the Republic of Mexico fulfilled. I fully realize that every drop of water in the Colorado River and its tributaries is highly significant, since the potential demands will far exceed the percentages of the 7,500,000 acre-feet allocated unto the upper basin States. Within the past 3 years it has been ascertained that it is potentially possible to utilize a great amount of water on the western slope of Colorado for the development of synthetic fuel, hydrogenation of coal, pulp-paper factories, and other developments.

I am deeply interested in the development of the natural resources of our State; however, I feel that I would be remiss in my duty as a member of the Colorado State Water Conservation Board, and as president of the South Western Conservation District, if I did not recommend that the Fryingpan-Arkansas project be constructed as soon as possible. I assure you that I am moved by no motive other than the good of Colorado as a whole. The replacement storage reservoir at the Aspen Reservoir site, with an active capacity of 28,000 acre-feet, a part of which is in excess of replacement requirements, will be available for future use in meeting usage demands in western Colorado, which in my opinion is sufficient compensation for the transmountain diversion known as the Fryingpan-Arkansas project.

The Colorado State Game, Fish, and Wildlife, are satisfied with the maintenance of the stream flow as outlined in the project for the Fryingpan River, while the loss and damage to the Roaring Fork River and its tributaries above the Aspen Reservoir from diversion of these streams will be prevented by extending the Hunter conduit to the South Fork of Hunter Creek and the enlargement of the tunnel from Chapman Gulch to the east end of the Fryingpan-Arkansas tunnel.

As a member of the executive board of the Colorado State association of the 23 Colorado REA State co-ops, naturally I am deeply interested in seeing that this project be developed to completion, since the project will withhold approximately 135,000 acre-feet of storage water for the development of electric energy, which will produce 400 million kilowatt-hours of electric power annually. It is useless for me to comment as to the need for this power, since your committee recognizes this need at the present time, saying nothing concerning future potential possibilities. Fifteen thousand acre-feet of this project water is needed immediately for municipal purposes in the cities of Colorado Springs and Pueblo as well as a number of valley towns located between Pueblo and the Kansas State line. The future municipal potential needs for these cities and towns approximates 53,000 acre-feet annually.

Definitely in my opinion as much of this water as economically feasible should be earmarked for municipal purposes.

In conclusion may I say: That I am a farmer and for the past 35 years the hungry Colorado winters have congealed my blood like the ice upon our lakes and rivers. During these years my plowshare did break the stubborn sod locking the golden sunshine in the furrow with the fond expectancy of a glorious harvest. Lands were then to be had for the asking, and our houses were built from logs hewn in the forest. Ours was a desolate desert land where the mountains lift through the snows their lofty and luminous summits. Where the elk and the antlered deer wandered over the hills until they were weary of travel and would lie down to rest; and the brown cinnamon bear, the anchorite monk of the forest, climbed downward to the abysmal depths of our canyons to dig for roots and herbs buried along the banks of our streams.

I reside on the western slope of Colorado, my geographic location is such that I am naturally inclined to oppose any transmountain diversion of water from the western to the eastern slope of Colorado. I am but human, therefore my first thought naturally would be, to conserve and develop the waters of the Colorado River and its tributaries for the benefit of those of us who reside west of the Rocky Mountains. But as a member of the Colorado Water Conservation Board and as

president of the Southwestern Water Conservation District, I am also deeply interested in the greatest good for the greatest number of people, therefore I am submitting this résumé in order to focus the points at issue in this project. I assure you that I wish no Stars of Bethlehem to hang on my Christmas tree, I do not possess the mind of an angel, nor the soul of a seer, I am only one of those horny handed sons of toil who enjoys the sentimental delight in gazing upon a reservoir filled with water, where schools of rainbow trout lie hidden like ingots of silver buried in the golden sands of the lake.

I have stood at the headwaters of the Fryingpan and Roaring Fork Rivers, where their tiny trickle flows among the rocks and pinnacles of the great Rocky Mountains in order to swell the floodtide of the Gulf of California. I am now asking that you gentlemen divert the waters of these streams along a most difficult route to the shores of the Gulf of Mexico. Why am I making such a request? In order that thousands of men, women, and children may slake their thirst from the cooling waters of our Rocky Mountain streams.

The men who grant the construction of this reclamation project will have written history, not upon tablets of stone, but within the hearts of a thirsty people.

Gentlemen: We ask that you hear and heed our small Macedonian cry to "come over and help us", praying that the multitudinous echo of our voices may not die away in the distance, but may you catch the vision of the golden sun shining upon abundant waters, where myriad water lilies rear their heads in resplendent beauty like a crown of gold upon the head of some Arabian princess, then our hearts will be filled with love for our fellow men as we usher into the dawn of another heaven; for the construction of this project will unite the majority of the people residing on the western and eastern slopes of Colorado in the bonds of love and friendship, such as we have never known before.

Mr. Chairman, we ask at this time that you extend unto us this magical golden wand in order that we may wave it in the midst of our people who will be touched by the holy fire that will melt and mingle us together.

I thank you.

Senator MILLIKIN. Mr. Morrison, please.

## STATEMENT OF JACK P. MORRISON, PUEBLO, COLO., REPRESENTING ORGANIZED LABOR, STATE OF COLORADO

Mr. MORRISON. My name is Jack P. Morrison. I represent organized labor for the State of Colorado, A. F. of L., pertaining to all water questions in the State of Colorado. I don't want to take up the committee's valuable time, so I would like that my statement be made a part of the record.

Senator MILLIKIN. It will be made a part of the record in full.

Mr. MORRISON. Thank you.

I also have the statement of Earl P. Law, who was unable to attend this hearing. At the time of this statement he was vice president of local 2102, steelworkers, CIO, and vice president of Colorado State Industrial Union Council. He is now in management, but this expresses his views and their views in support of the Fryingpan-Arkansas project at this time. And I would like that this be made a part of the record.

Senator MILLIKIN. It will be made a part of the record in full.

Mr. MORRISON. I also have the statement of George White of Pueblo, Colo., representing the United Steelworkers of America, Franklin D. Roosevelt Lodge No. 2102, affiliated with the Congress of Industrial Workers, who was unable to attend this meeting and would like that his statement be made a part of the record.

Senator MILLIKIN. That will be done.

Mr. MORRISON. Thank you very much, sir.

Senator MILLIKIN. Thank you for coming, but before you leave the stand, tell us a little about the steel activities at Pueblo so that we

can get some perspective on what the endorsement of the steelworkers there means. How many men are employed at the steel works in Pueblo?

Mr. MORRISON. Senator Millikin, I am with the A. F. of L. I am not qualified to answer that question. However, there is a man in the room who I believe is qualified to answer that. May I refer to Mr. Christy?

Senator MILLIKIN. Mr. Christy, will you come to that in your statement?

Mr. Christy. Yes, sir; I will cover that in my statement.

Senator MILLIKIN. We appreciate your coming, Mr. Morrison.

Mr. MORRISON. Thank you, Senator Millikin.

(Statements of Messrs. Morrison, Law, and White follow:)

STATEMENT IN SUPPORT OF THE FRYINGPAN-ARKANSAS PROJECT, BY JACK P. MORRISON, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, PUEBLO, COLO.

Gentlemen, my name is Jack P. Morrison and I represent organized labor. Approximately 40 years of my life have been spent in the immediate vicinity of Pueblo and the Arkansas Valley. During this entire period I have been closely associated with organized labor, first in the role of an interested onlooker and later, and at the present time, as an active member.

I can personally vouch for the 100 percent support by organized labor of this great project, and while my entire group recognizes and appreciates the values and benefits to be derived from its completion, other than those pertaining to payrolls, employment, etc., I wish to discuss these phases of the project only, and have no apologies to make for what might on the surface appear to be a selfish or mercenary attitude.

On all estimates of the cost of the Fryingpan-Arkansas project, the item "Payroll" has been listed as the largest one item to be considered, and if, for instance, the original estimated cost of $147,440,000 is used, it is conservatively estimated that the payroll alone will amount to $48,976,840, or 33 percent of the entire cost: 66 percent of the workers involved will be skilled, 22 percent semiskilled, and 12 percent common labor. A breakdown of the different crafts, or classification, of such workmen in relation to their importance on the construction, shows the approximate man-hours for each craft as follows: heavy equipment operators, 7,650,000; carpenters, 4,420,000; pipe fitters and welders, 1,940,000; structural steel workers, 1,940,000; electricians, 1,450,000. Above classifications all come under the heading of skilled workers and in addition to the man-hours listed, the helpers, or semiskilled workers are expected to raise the total figure by 9,400,000 man-hours and the common labor group by 5,400,000 man-hours.

A quick rundown of how the workers will spend the approximate $48,976,840 they will earn is as follows: Food, $12,293,190; housing, utilities, etc., $6,758,800; household operation, $1,861,120; furnishings and equipment, $2,057,030; clothing, $5,485,410; transportation, auto, etc., $5,436,430; personal care, $1,028,510; medical, $1,959,070; recreation, $1,812,140; education (formal), $195,910; gifts, contributions, etc., $1,028,510; insurance, $1,469,310; personal tax (State and Federal) $7,591,410.

The above figures represent of course the period of actual construction. However, organized labor is looking beyond this period and visualizing the vast amount of maintenance on the completed project. This vision holds a promise of job opportunities in new industries, minimum unemployment, steady incomes, elimination of manpower migration, and a rise in living standards for workers with increased opportunities for them and their families. All of this will go far toward inspiring the construction worker with a feeling of dignity comparable to that of his white collar or professional neighbor.

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STATEMENT IN SUPPORT OF THE FRYINGPAN-ARKANSAS PROJECT BY EARL P. LAW, UNITED STEEL WORKERS, C. I. O.

Gentlemen, my name is Earl P. Law, of Pueblo, Colo., I hold the office of vice president of local 2102, United Steel Workers, CIO, and vice president of Colorado State Industrial Union Council. I am employed by the Colorado Fuel &

Iron Co., of Pueblo, Colo., in which city or the vicinity thereof I have resided since 1919.

I have been instructed and requested on behalf of the above organizations to represent the CIO on all phases of the Fryingpan-Arkansas project.

Organized labor is interested in job security, continued prosperity, and the maintenance and improvement of the existing economy, not only of the Nation and Colorado, but particularly of the Arkansas Valley. In this respect the interests of the Arkansas Valley, the State, and the Nation and organized labor are identical—all depend upon the existence and availability of an adequate water supply. This accounts for the interest of organized labor. Present water supplies are inadequate for the existing requirements of industry and agriculture, cities, and farmers. The cost of procuring additional supplies of water for the needs of the area exceeds the ability of the users to finance the project without Federal assistance. The Fryingpan-Arkansas project bespeaks a genuine need for water, and from all information that we can obtain it presents ample justification for the authorization of a Federal reclamation project.

Additional waters made available by the project would make possible more job opportunities, increasing the self-sufficiency and productivity of the Arkansas Valley and the State of Colorado. This project will directly supply many jobs during construction, as well as afterward. In addition, it will make possible substantially increased industry in the area, which increase will afford opportunities to widely diversified industries. Diversification and the distribution of industry will fit in with the defense requirements of our Nation.

The CIO as an organization is confident that the authorization and construction of the Fryingpan-Arkansas project will greatly increase both the population of the area and its industrial opportunities. It is with an honest and sincere belief that we say the Fryingpan-Arkansas project should be authorized.

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STATEMENT BY GEORGE J. WHITE IN SUPPORT OF THE FRYINGPAN-ARKANSAS PROJECT

I am George J. White, age 32, of Pueblo, Colo., representing the United Steelworkers of America, Franklin D. Roosevelt Local 2102, affiliated with the Congress of Industrial Organizations, and presently serve in the capacity of secretary of the grievance committee. Local union 2102 represents the production and maintenance workers of the Colorado Fuel & Iron Corp. and has a membership of 6,020. I am a lifetime resident of Pueblo and have worked for the C. F. & I. Corp. for 14 years; of those 14 years, I have been a union member 13 years and an officer or committeeman for 8 years.

Our union is in favor of the Fryingpan-Arkansas project and I will herein attempt to give our views on the immediate and future benefits we as citizens will enjoy through an expanded and prosperous community which would be made possible by the project.

The majority of union members are family men and homeowners and as such are civic minded and interested in the growth and development of Pueblo, and of Colorado as a whole. Water has become more of a problem with the growth of the Pueblo area during and after the war and will continue with the expansion of the Pueblo Ordnance Depot and the C. F. & I. This year it was necessary, as early as March, to restrict irrigation in Pueblo, and from the present outlook, more severe restrictions will be imposed by early summer.

If we are successful in securing this project, it will mean an almost immediate expansion of Pueblo as is evident by the number of prospective small industries that have indicated their desire to locate in this area if water were available.

If either of the two major sources of employment in this area found it necessary to release some of its workers or execute a complete stoppage, the immediate result would be a recession of all businesses; the continuance of such a condition inevitably resulting in further unemployment and a ruination of our economy. However, if more people were employed in divers industries, the chances of such a demoralizing condition would be minimized. The expansion of small business, however, would create a greater labor market and would balance the two major employers, the C. F. & I. and the Pueblo Ordnance Depot, by having the capacity to absorb workers who are laid off, and thus prevent most of the unemployment problems and stabilize the local economy.

It is certainly not good for an area as large as is involved here to be so dependent on two employers and an increase of water and power would undoubtedly be

influential in bringing other industries to the area, resulting in the placement of more laborers.

With the expected expansion of the area, it would offer unlimited opportunities for both business and professional careers. In our opinion, this is a major factor: The average millworker has 3 or 4 children and they will all be seeking employment some day but with employment limited as it is, the unfortunate result is that these future workers will be forced to leave home to seek positions elsewhere, causing unhappiness for both the parents and the children and possibly an instability that could very easily lead them down the wrong path of life. Furthermore, it isn't advantageous or complimentary to a community if the workers of tomorrow are forced to leave their home town because it couldn't fit them in and then not be available when the need for them arose.

The project would have a two-fold effect on Colorado Fuel & Iron Corp. employees. With farming and allied industries expanding, products manufactured at the Colorado Fuel & Iron Corp. Pueblo plant would find a ready and close market, i. e., the Colorado Fuel & Iron Corp. makes all forms of wire fencing, baling wire, barb wire, and etc.

Assuming the Colorado Fuel & Iron Corp. were to get the contracts for supplying steel products for the project, all of it could be produced locally in Pueblo except for some sizes of required pipe. Besides the monetary savings to the project, it would mean they would have enough contracted work to employ all its employees 1 month; this includes the time spent in iron ore and coal mining the railroad shipping thereof, and so forth. Listed below are verified figures supplied me by the Colorado Fuel & Iron Corp. on man-hours required to produce the estimated steel products required in the construction of the project:

| Product | Amount required | Man-hours required |
|---|---|---|
| Reinforcing steel.....pounds.. | 175,129,000 | 1,397,362 |
| Structural steel.....do.... | 12,642,700 | 82,008 |
| Miscellaneous steel bars and shapes.....do.... | 325,900 | 2,757 |
| 130-pound rails.....gross tons.. | 7,000 | 84,155 |
| Pipe, 22- and 26-inch.....miles.. | 70.6 | 149,600 |
| Total..... | ..... | 1,715,882 |

We want it understood that our point of view is not based on a selfish desire to keep only Pueblo and vicinity employed, as the above points out that some sizes of the required pipe cannot be produced locally and would be obtained from Claymont, Mass. Also, not all the ore and coal is mined in Colorado but in the adjoining State of Wyoming.

In endorsing the project, we can see a better and larger community—one in which our children can grow up healthy and happy and can look forward to a secure future—a future in which a balanced economy will offer full employment.

In summarizing, we feel that what is good for labor is good for the community, State, and country, and the Fryingpan-Arkansas project will offer benefits to labor, thus being beneficial to all.

Senator MILLIKIN. Who do you wish next?

Mr. DUCY. Mr. Christy.

Senator MILLIKIN. Mr. Christy, we are glad to see you, sir.

## STATEMENT OF HAROLD H. CHRISTY, PUEBLO, COLO.

Mr. CHRISTY. Thank you, Senator. For the record and for purposes of identification, I am Harold H. Christy, of Pueblo, Colo., I am a native of the State of Colorado and I have spent most of my life in that State. I am a registered professional engineer in the State of Colorado, being a graduate of the Colorado State School of Mines.

Since 1929 I have been employed by the Colorado Fuel & Iron Corp., at Pueblo in charge of their water and power, and for the past 5 years have been superintendent of the power and water departments of that corporation.

I have been a member of the executive committee of the Arkansas Valley Ditch Association since 1930. I am a director of the Water Development Association of Southeastern Colorado, the organization which has been referred to as the proponents of this project.

I was a member of the policy and review committee appointed by the Colorado Water Conservation Board to make a study together with representatives from western Colorado of the features of the Fryingpan-Arkansas project. Since the report of this committee was presented to the Colorado Water Conservation Board and subsequently approved by that board and the State of Colorado, I have been appointed by the board to what is now known as the Colorado Conference Committee, which is presently engaged in resolving the problems within that State leading to an overall, longtime plan or program of that State for using the water which is allocated to the State under the upper basin compact on the Colorado River.

I would like briefly to develop or present for your consideration the past development in the Arkansas Valley in order to establish what private enterprise in that area has accomplished since the first settlement.

In order to give you a better perspective of the problems we have I would merely state that the Arkansas River, as has been mentioned here, heads near the Continental Divide at an elevation of some 14,400 feet. The river falls, as has been mentioned, to an elevation of about 4,500 or 4,600 at Pueblo and passes across the State line at some 3,000 feet elevation.

It has been mentioned here that the elevation of the collector system on the west side of the Continental Divide is at the elevation of 10,000.

I wish specifically to call attention to the elevation of the Aspen Reservoir, which is approximately 8,000. I make that statement due to some confusion as to whether any of the water from the Aspen Reservoir, stored behind that dam forming Aspen Reservoir, is actually transported to eastern Colorado. That reservoir is what is known in our parlance as a compensating replacement reservoir, fitting into the program being developed by the State.

Senator MILLIKIN. Tell us exactly what is a compensating or replacement reservoir, and what its functions are.

Mr. CHRISTY. If it is a compensating reservoir, in that instance in order to permit a project to make diversions during certain stream flow conditions—I am defining a replacement at present.

Senator MILLIKIN. Let me change my question. What is the function in this project of the Aspen Reservoir?

Mr. CHRISTY. The function in this project of the Aspen Reservoir is first to provide replacement so that the senior priorities may be supplied during low-flow conditions on the stream and permit the project facilities to divert water to the eastern slope, thus protecting those senior priorities.

Senator MILLIKIN. Senior priorities on the western slope?

Mr. CHRISTY. Yes. There are provisions in that reservoir to firm up the uses of water during the late summer months in the Aspen area and the Roaring Fork as far down as its junction with the Colorado River at Glenwood. There are also provisions in that reservoir for water to bear the proportionate share of the water contributed by the Roaring Fork for industrial uses in western Colorado or the future potentials in that area.

There is also space in the reservoir to permit winter diversions by the project facilities under certain conditions. Winter diversion, however, will no doubt be very limited.

Senator MILLIKIN. That is for use on the western slope?

Mr. CHRISTY. For use in western Colorado.

Senator MILLIKIN. The tactical purpose, then, of the Aspen Reservoir is to do away with complaints that might otherwise exist against the proposition on the western slope?

Mr. CHRISTY. That is right, sir.

Senator MILLIKIN. And it effectively does that, does it not?

Mr. CHRISTY. Yes.

Senator MILLIKIN. It says all just claims of those who have priorities to the waters in the streams from which we are taking water.

Mr. CHRISTY. It was the opinion of the Policy and Review Committee and the report of the State that all present and future potentials in that area were protected.

Briefly, the history of development in the Arkansas Basin in Colorado started about 1859 and consisted of small rivers and tributaries near the headwaters adjacent to mining operations and developments, and it expanded accordingly. The first priorities or appropriations for water in the area occurred during the period 1859 to 1869 on the tributaries. There was another period from 1870 to 1879 when the appropriations to tributaries were materially increased.

Senator MILLIKIN. Tributaries of the eastern slope?

Mr. CHRISTY. On the eastern slope, the Arkansas River. I am talking now of the development in this basin, of the waters of the Arkansas River Basin.

Senator MILLIKIN. What are some of the famous old mining camps?

Mr. CHRISTY. Leadville is one of the old camps. It is still famous. Right above Twin Lakes there was a mining development on Lake Creek. There was some placer mining in the area between Leadville and Buena Vista. There was some mining development in the Salida area, and of course on Pike's Peak, which is on the drainage of the Arkansas and the Fountain River; some camps on Cripple Creek, Victor, and Goldhill, Independence, and different communities established around that development.

During that decade from 1870 to 1879 there was only some 900 cubic feet per second of decrees obtained on the main stem of the Arkansas River.

The first major development on the main stem occurred in 1974 in the Rocky Ford area. Interest in irrigation below Pueblo resulted in development and appropriations from the main stream of the river totaling approximately 3,000 cubic feet per second between the years 1880 and 1889, and an additional 3,000 cubic feet per second was appropriated during the following decade.

Senator MILLIKIN. Can you translate that into acre-feet offhand?

Mr. CHRISTY. The testimony heretofore given indicated that the flow had varied from 200,000 acre-feet a year to as high as a million.

Senator MILLIKIN. Do not bother with it now, Mr. Christy.

Mr. CHRISTY. It is a way in excess of the maximum flows that have been testified to here, because the amounts available for these appropriations are firmed up only by decrees under testimony of actually having made it, and are not an indication of availability of water for continuous diversion.

During this period practically all of these small ditches that have been developed, that had been developed in the 1870's and some in the 1860's, were consolidated or transferred to some of the major ditch systems which were being constructed in the area. These early priorities represent the dependable water rights in the consolidated system as compared with the priorities established under these systems by reason of their construction.

Of the larger ditch construction, they have obtained decrees by right of construction. Following the above development of irrigation systems supplied by direct flow rights, a few drought seasons occurred, definitely establishing the need for supplemental water supply controlled for use during offpeak flow periods.

This resulted in the construction of numerous plains reservoirs on the tributaries of those streams shown on that map leading into the main river in the area below Pueblo. These reservoirs to capture runoff from rains on those drainages. Time again proved the inadequacy of this source of supply and subsequent decrees were obtained from the main stem of the river by reason of the enlargement of the existing ditches or new ditches from the river were constructed to feed these side drainage reservoirs.

Three mountain reservoirs were constructed during this period and together with the flood right ditches referred to above, controlled the high runoff of snow water in the spring as well as the flash runoff in heavy rains during July and August.

The records indicate that this period of storage development ended about 1910.

All of the above-mentioned ditch and reservoir construction was accomplished by means of private capital. Comprehensive investigations will indicate that full development of water resources possible under private financing has been accomplished. It has been said here that the easy development, the cheap, low-cost projects have been built down through the years, not only in this valley but in other places in the arid West. In fact, overdevelopment occurred as a ditch and reservoir on the Spishapa River was washed out by flood in 1923 and was never rebuilt.

Senator MILLIKIN. We suffered a lot from optimistic promotions, did we not?

Mr. CHRISTY. Yes, due to a few wet years and the record streamflows on the Arkansas are similar to those in the arid States, the flow curves of the Colorado River being no exception. You have to plan on long-term averages due to the variance in nature.

Stating this in another way, let's say that all single-purpose project developments has been accomplished. This is true due to the wide variation in runoff from October to October of each year, which has already been testified to, and I again wish to impress the committee with the fact that this average ranges from 195,000 acre-feet annually to a high of 933,000 acre-feet annually at the Pueblo gage. The mean average annual runoff for the period 1910 through 1944 at the Pueblo gage is on the order of 513,000 acre-feet.

During the period 1860 to 1910 the irrigated acreage increased from practically nothing to a peak of some 550,000 acres. That is on the Arkansas River drainage. It continued at approximately this amount until the late 1920's. This acreage under irrigation has been on the decrease since this time primarily on account of inadequate water

supply to an average during the last decade of approximately 460,000 acres; that is, in the basin, of which 322,000 acres is specifically included as being benefited by the Fryingpan-Arkansas project. This indicates a reduction in irrigated agriculture on the order of 80,000 acres. These figures are for the drainage basin, as I have mentioned.

Reductions on the main stem of the river will account for the major portion of the decrease account of the development on the tributaries having a more dependable water supply.

I wish to point out that the early development I mentioned was to tributaries and up at the high elevations close to the mining development which was occurring at that time, and, therefore, carried priorities of an early date on the river.

The only increase in water supply since the first decade in 1900 has been the construction of some 6 small transmountain diversion ditches, each producing from 900 to 7,000 acre-feet annually. The total increase in water supply from 1910 to 1935, resulting from these transmountain ditches, was on the order of ten to twelve thousand acre-feet annually, and most of these ditches were little surface ditches through low divides or advantage was taken of abandoned railroad tunnels, low-cost development which could be done by small ditch groups or an individual ditch rather than collective enterprise.

The first transmountain project of any size on the Arkansas River was constructed by the Twin Lakes Reservoir & Canal Co. known as the Independence Pass transmountain diversion. This project was placed in operation in 1935 and since has contributed (depending upon runoff, of course) up to a maximum of around 45,000 acre-feet annually.

Senator MILLIKIN. Did they drill their own tunnels?

Mr. CHRISTY. They drilled their own tunnels. The Twin Lakes Reservoir & Canal Co. was forced to construct this project due to the droughts in the early 1930's.

All of the above-mentioned projects were accomplished, as mentioned above, by private financing and with feasible single purpose projects account of taking advantage of the low mountain passes that I have mentioned.

The only help that this valley has had up to the request for this project has been the construction of the John Martin Reservoir project on the lower river which was constructed by the Army engineers and placed in operation in the early 1940's as a flood control and conservation project. The capacity of the John Martin Reservoir for carryover of the the flash runoff, in addition to the flood requirements, is an excellent example of the benefits mentioned above in connection with large multipurpose projects. Most of the area to be benefited by the Fryingpan-Arkansas project lies west or upstream from the John Martin Reservoir.

I would like now to refer to the development and the conditions surrounding the domestic water supply in this valley.

During the period of agricultural expansion and the subsequent stalemate or backward trend, the human and livestock requirements for water in the valley was constantly increasing. Population in towns and cities increased from a trading-post stage to thriving communities. Municipal and domestic requirements played some part in the reduction of the water available for agriculture, particularly in the vicinity of the two largest cities, Pueblo and Colorado Springs

areas, these communities having a population in 1950 in the metropolitan areas approximating 90,000 and 60,000, respectively.

The growth of Colorado Springs area led to the acquisition of ditch rights along the Fountain River between Colorado Springs and Pueblo, and the transfer of these rights to their headquarters reservoirs.

I believe, Senator, with your permission, I will not go further into the Colorado Springs supply, but present the statement which you requested a few moments ago.

Pueblo is supplied by 2 water districts, which in the early days acquired some 8.29 cubic feet per second of priorities dating 1870 to 1872, the acquisitions being by original construction or purchase of small irrigation ditches.

The districts also acquired decrees for 22.66 cubic feet per second in 1884, and 46 cubic feet per second in 1889. The combination of these rights proved adequate for the city's use until the early 1920's, at which time the trustees of the districts attempted to purchase additional irrigation priorities in the Canon City and Florence area. Two attempts at transfers were made, but were refused by the courts, leaving them with the only recourse of condemnation, which was gone into to some extent this morning.

I believe Mr. Breitenstein is more capable to discuss that matter, if some members of the committee desire to enlarge upon it.

Following these activities, the trustees negotiated a consent decree in 1930 with the major lower river ditch organizations whereby they gave up 68.66 cubic feet per second of 1884 and 1889 priorities for 45 cubic feet per second of date 1874. This trade was accomplished on account of the ditch owners believing that the municipality had to have water and that the resulting action in reducing the total amount of diversion decrees would result in a gain for agriculture.

Senator MILLIKIN. How much return is there from municipal use of water?

Mr. CHRISTY. I would say in the Pueblo area, about 75 to 80 percent of the water returns to the streams.

Senator MILLIKIN. Would it be roughly the same from the other towns down the river?

Mr. CHRISTY. I would say roughly the same, possibly a little better return, depending upon their location.

The 1874 date, which was considered a continuous flow decree, appeared to be a good trade to the trustees. However, had the low flows of the next decade been known at the time of this consent decree, it is not likely that the ditch owners would have consented to the 1874 date.

The records will indicate several occasions when the river has ceased flowing at the South Side Dam at Pueblo, which is the official Pueblo gage. This dam is a part of the diversion works at the Pueblo South Side Waterworks, and also is the location of the official gage, as I mentioned. During the year 1934, the river flow was reduced for a prolonged period, necessitating the sticking of wells in the riverbed to obtain sufficient water to meet restricted municipal requirements.

This water, of course, did not legally belong to the city, and its quality was questionable.

Following this experience, the trustees for the North Side Water Board, Pueblo, acquired a small transmountain ditch from the Eagle River, a tributary of the Colorado, as a supplemental supply.

You asked specific questions about this ditch known as Wurtz transmountain ditch. In the absence of reservoir storage space, this transmountain water has been stored by agreement in the Sugar Loaf Reservoir near Leadville, Colo.

Continued growth during the last war resulted in the city's being threatened with legal action by the lower river ditch owners account of over diversion of the city's rights.

In 1950, the trustees again attempted to acquire some older irrigation rights for municipal use, but failed in their attempts due to ditch-owner protests.

The above clearly indicates that Pueblo has depleted all of the available Arkansas River supply without condemnation proceedings of irrigation rights, which would, of course, result in further reduction of agricultural production in this valley. These domestic requirements must be supplied from a source other than the Arkansas River.

The Colorado River represents the only remaining source of supply available to the Arkansas River Basin.

Since the available supplies from the Colorado River drainage occur during high spring snow runoff, large municipal diversions will be necessary during short periods, which in turn will require large storage reservoirs in the Arkansas drainage basin. Thus, domestic requirements for the future are definitely tied to large multipurpose projects in order to provide orderly development.

The Fryingpan-Arkansas project design meets the municipal domestic requirements east of Canon City due to the large holding reservoirs at high altitude and the proximity of Pueblo to the terminal-storage reservoir on the project. As Mr. Powell has mentioned, the elevation of that reservoir and the filtration plants are at proper elevation to deliver that water to the city under pressure.

The terminal storage of Pueblo Reservoir, coupled with the valley pipeline and treating plant, will provide water for future human consumption in Pueblo as well as the remainder of the Arkansas Valley towns.

In planning a project of this nature, the human and animal requirements in the urban and rural areas must be considered. It is anticipated that numerous delivery points will be provided along the valley pipeline for service to urban and rural population. Drinking water throughout the entire area is of questionable quality, and presently hauled from towns to farm sites for human as well as livestock consumption.

Most of the towns east of Pueblo have depended upon well supply. However, during late years, some have been forced to sink wells in the river flood plain or divert and chemically treat ditch water, the ditch water being of much better quality insofar as hardness is concerned than the well water last mentioned.

Well supplies are not dependable in the Arkansas Valley as to quality, continuous flow, and volume.

Senator MILLIKIN. In those towns where they want more dependable water supply, they would have to condemn the water, would they not?

Mr. CHRISTY. That is the only way they could do it.

Senator MILLIKIN. Aside from this project.

Mr. CHRISTY. This is peculiar to the Arkansas Valley and the attemps shown here of transfer by the city of Pueblo very definitely

indicate that the only way they could get water would be by condemnation.

Yes. I might add here that the towns above Pueblo being adjacent usually on the banks of the river can also be assisted in their domestic requirements.

Senator MILLIKIN. I think the question has been asked several times, but now let me ask you this: Considering the municipal water supply in and by itself for Pueblo and these other towns, would they on their own get the water from the western slope and get it feasibly?

Mr. CHRISTY. Based on studies that have been carried on in that valley for a good many years, Senator, I seriously question that, with the peculiarities of the different municipal requirements, it would be possible to do it other than through a project of this kind.

Senator MILLIKIN. So that the only alternative that presents itself is a multipurpose project such as this one where each phase of it helps the other phase?

Mr. CHRISTY. That is right. There is one other item here that is very important, I feel, on our drainage and that is that there are few good reservoir sites and most certainly it is wise and lends to better economy to have a full development of that site rather than have piecemeal or have one entity acquire rights to the site and then subsequently have to have it enlarged.

The question has been raised as to the costs of municipal water. There is a credit, in my opinion, to the project in respect to the cost of water and the cost of the pumping and chemical treatment presently in effect in those various areas to obtain the water they are now used to because the quality of the water from the Pueblo Reservoir will be of a nature which will eliminate those present expenses that they are encumbering and experiencing every year.

I would like to mention that this project reservoir located some 6 miles west and upstream from Pueblo constitutes a typical multipurpose unit of the Fryingpan-Arkansas project. The municipal development of this site as a single-purpose project could well result in detriment to future overall plans for basin benefits as only limited reservoir sites are available. This is a repetition of what I just said, but it is very important in our plan.

The necessity for costly railroad realinement through the site also prohibits the use of the site as a single-purpose reservoir. Combined use of a site of this type results in lower unit cost and the pooling of storage interests at the site will result in lower surface evaporation losses, thus conserving the limited water supply available.

The Pueblo Reservoir is absolutely necessary for flood protection to the city of Pueblo and the immediate reaches of the river below Pueblo unless large sums of money are expended in channel work on the Fountain and for miles downstream on the main river below the junction of the Fountain and the Arkansas. This time interval between floods of great magnitude tends to enhance destruction of property and life when they do occur on account of the conditions of the channel. I am referring there to the continued depletion of bedrock. When the flash flood occurs there is no channel present and it spreads out all over the adjacent area.

Following the flood of 1921, at which time some 78 lives were lost and property damage of approximately $19 million occurred, the city of Pueblo formed a conservancy district. Under the auspices of this

district, a flood channel through the city and a barrier dam were constructed at a total cost of from 9 to 10 million dollars to the local taxpayers. Again, we find evidence of local interests having provided for their own protection without Government participation.

This conservancy district work provides a channel through the city with carrying capacity of approximately 120,000 cubic feet per second. However, due to the conditions of the channel below town, competent engineers feel that a flow of approximately 60,000 cubic feet per second would inundate the present water works facilities, leaving the community of approximately 90,000 people without water for domestic consumption and fire protection.

Construction of the Pueblo Reservoir will control the flow through the flood channel to an estimated maximum of 25,000 to 30,000 cubic feet per second, this peak flow being the result of flash runoff on drainages tributary to the river between the reservoir and the waterworks systems.

The reservoir will also provide space for storage of winter flow, permitting the application of this water on crops during the growing season; also space for storage by agreement among the water users of water normally held in the lower plains reservoirs on which excess evaporation occurs, and that is a very serious item in that area.

Any reduction in the evaporation naturally increases water for application directly to the crops or for municipal use. This storage of the winter flows and the exchange of storage from the plains reservoirs must be accomplished under the Colorado statutes by agreement among the water users. All of the larger ditch companies in the lower valley have signified their willingness and intention to work out such an agreement. Service charges on this type operation of the Pueblo Reservoir will provide the contracting agency with some additional funds for repayment to the Federal Treasury for expenditures on the project and represent possible additional security for the investment.

Senator MILLIKIN. The new project features will also mitigate the sedimentation problems which the canal ditches below Pueblo are suffering with; is that not correct?

Mr. CHRISTY. I am very much of the opinion that the benefits to sedimentation included in this project are on the very conservative side rather than optimistic. It is a very serious condition at the present time and all of the heavy bedload originating below the Pueblo Reservoir site will be captured in that reservoir and, as Mr. Powell has stated, space is provided in the planning for that bedload.

Senator MILLIKIN. It is very harmful now.

Mr. CHRISTY. That is right, sir. We not only have the sediment control that you have mentioned but we also have the electric power that Mr. Powell mentioned.

There is one thing that is disturbing the people in the area to some degree and that is the Federal regulations relative to uniform quality in connection with water supplied for use in interstate commerce will no doubt force the addition of a filtration plant and so forth in that area. Large expenditures of funds for these facilities independent of some overall plan for the valley would be false economy. A manufacturing and transportation center along the front range of the Rocky Mountains together with the agricultural production including the local trade centers certainly should warrant full consideration and

opportunity to participate in the reclamation and flood-control program of the Nation.

I would like to briefly mention industrial development in that area and answer any questions that I can relative to the steel.

Senator MILLIKIN. I wish you would.

I would like to interject something at this point. It may be that someone will cover it but we have taken pretty good care of many of our great river valleys up to this time. We have done so on the Columbia and we have done much on the lower reaches of the Colorado. We have done much on the Tennessee. This is a project which derives its water source from the upper reaches of the Colorado. Practically speaking I do not know of anything we have done in the upper part of the Colorado River and I think just in plain fairness we owe it to that region to develop that water resource which includes proper diversion such as this one.

Mr. CHRISTY. You are certainly right, sir.

Senator MILLIKIN. Do we have anything on the upper Colorado?

Mr. BREITENSTEIN. The Big Thompson.

Senator MILLIKIN. The point I am making is, we have done fairly well with the lower Colorado. We have done fairly well with many of these great river basins, but, practically speaking, we have done nothing with the upper Colorado.

Mr. CHRISTY. That is right, sir.

Senator MILLIKIN. This will be a project that will make appreciative use of part of the waters of the upper Colorado.

Mr. CHRISTY. Allocated to Colorado, that is right.

Pueblo, the trade center of the Arkansas Valley, is the location, since 1880, of the Minnequa plant of the Colorado Fuel & Iron Corp., an integrated steel plant. This is the major production unit of the ninth largest steel company in America. One of the major reasons for this plant being located at Pueblo was water supply. Due to the large quantities of water necessary to operate a steel plant, the corporation was forced to develop its own water supply. Its system consists of some 66 miles of ditches from the main Arkansas River and from the St. Charles River, together with storage reservoirs in the Pueblo area.

The corporation also owns Sugar Loaf Reservoir located some 6 miles west of Leadville on the headwaters of the Arkansas River.

The water supply for this plant from the Arkansas River, as in the case of municipal supplies, was obtained in 1907 at the expense of agriculture. In other words, an old irrigation system was purchased, including land and improvements and the water rights transferred to the corporation's point of diversion. The reservoirs, of course, were decreed by reason of construction and beneficial use. The steel plant's system supplies all of its industrial water. However, drinking water is provided from the city's system.

I wish to add here that even though we are not participating in any of the water being developed by the Fryingpan-Arkansas project, having some 8,500 employees in that community, the Colorado Fuel & Iron Corp. is intensely interested in a domestic supply for those people and their families.

Senator MILLIKIN. You have 8,500 people and their families that are consuming water. I would like to see the human elements of that project developed. I am glad you are telling us about that.

Tell us who else works there. I want to get the human picture of the city of Pueblo.

Mr. CHRISTY. I think our statement about our interest in these 8,500 employees is absolutely just as true in connection with some 7,500 employees of the Pueblo Ordnance Depot.

Senator MILLIKIN. And they have their families.

Mr. CHRISTY. And they have their families, and those families live mostly in the area adjacent to Pueblo. Some of them are coming from Colorado Springs, Florence, Canon City, and from Fowler, La Junta, and the cities downstream from Pueblo, who will be supplied by this municipal pipeline if it is included in this project.

Senator MILLIKIN. The defense aspects of this project, which are important now and as far as we can see will probably be important for a long time to come, although I hope they do not remain important, are the Pueblo Arsenal, which employs how many people?

Mr. CHRISTY. 7,500, approximately.

Senator MILLIKIN. And the steel company which employs a considerable number.

Mr. CHRISTY. 8,500.

Senator MILLIKIN. You have done a lot of defense work down there, have you not?

Mr. CHRISTY. Yes, sir. I was going to mention some of our products. I thought that would answer the question.

Senator MILLIKIN. Very well. Take your time. In Colorado Springs we have Camp Carson and Peterson Field. Down through the valley we hope to revise maybe the La Junta Airbase sometime, and so forth, so we have a distinct defense significance for this project, at least for the present and as far as we can see into the future.

Mr. CHRISTY. Yes, sir.

The Colorado Fuel & Iron system is mentioned in order to clear anyone's mind of the thought that the Fryingpan-Arkansas project will in any way subsidize a major industrial enterprise.

Senator MILLIKIN. You have your own industrial water?

Mr. CHRISTY. We have our own industrial water. A review of the report will indicate the corporation has agreed to cooperate with the United States Bureau of Reclamation or the conservancy district contracting for the project to the extent the corporation's Sugar Loaf Reservoir site and land around this reservoir may be utilized so long as the vested rights of the corporation are not diminished or interfered with.

Senator MILLIKIN. Pueblo is a great jobbing center; is it not?

Mr. CHRISTY. Yes, sir. It is the wheel of southeastern Colorado and serves that are east, south, and west.

Senator MILLIKIN. You have many small manufacturers in Pueblo, have you not?

Mr. CHRISTY. Many of them.

Senator MILLIKIN. And many more are coming in.

Mr. CHRISTY. There have been numerous inquiries investigating that location, and water supply is a very important item in considering the location of a new enterprise.

Senator MILLIKIN. I recall one or two sizable captures that you made down there in the last year or two.

Mr. CHRISTY. One of our other witnesses refers to some of those and I did not include them in this for the sake of brevity. We appreciate the time you and the committee have given us.

Senator MILLIKIN. Will that gentleman develop the transportation significance of Pueblo and the number of railroads that come through there?

Mr. CHRISTY. Yes, sir.

Senator MILLIKIN. When we get around to it, I want the Senate to understand what we are talking about, not only economically, but in human terms.

Mr. CHRISTY. I can give you the list of the transcontinental railroads and so forth.

Senator MILLIKIN. How many railroad employees do you have at Pueblo?

Mr. CHRISTY. Senator, I am going to let one of these other men answer that from the chamber of commerce.

Senator MILLIKIN. All right.

Mr. CHRISTY. You will note that storage space over and above the existing decree is to be paid for in the same manner as other reservoir sites used by the project.

I might indicate here that there has been expansion in this steel plant over the last 20 years. The daily water consumption has increased from some 32 million gallons per day to an average now in the order of 60 million gallons, this demand being the requirements from the reservoirs and does not include the amount of repumping and reclaiming of water within the plant itself.

It is interesting, I feel, that during and when the flow of the river was practically nil or as low as 6 second-feet, the return flow from this plant was in the order of 120 cubic feet per second and was supplying the older priorities below Pueblo at a time when they needed the water to either get their ground ready for planting or for the first irrigation in that area.

Senator MILLIKIN. And if you were not sure of your own water supply you would be out of business.

Mr. CHRISTY. We would have been out of business ourselves, and we have also a balancing factor in the economy of that valley, I am sure.

This plant produces many items required by the defense effort, including shell steel, barbed wire, miscellaneous structural shapes, rails, and fastenings, and with the completion of the tube mill, gun casings, as well as seamless tubes. Recent and planned expansion with new products will tend to draw allied industries to the area. These industries will require water for their use and their employees and, along with the corporation's use, will increase the demand for domestic water.

It is right along the line that we are talking about of the normal growth in that area, making domestic supply a first priority.

I would like briefly to refer to the power market. I will confine these remarks to just a short statement because representatives of power companies are here and are making a proposal. Mr. Powell has indicated the importance of power in the area and it would simply be a repetition of the record unless there are some questions that I could answer.

Raw materials known to be available in the project area present a ready market for low-cost power, and it has been so testified. Many of the coal and metal mines have been flooded out. Low-cost power, particularly secondary power, could be consumed in unwatering these mines, thus restoring the economy of these areas.

The Arkansas Valley presently is not tied in with any large electrical grid system whereby interchange or large blocks of standby power are available. This condition has made it necessary for each local system to provide capacity in excess of that required in an area where interchanges permit the pooling of surplus capacity to provide for emergency standby. This condition has to some degree prohibited installation of metallurgical furnaces in the area as demand rates of necessity must be higher if a single system reserve is required as standby.

As has been previously stated, our corporation has its own powerplant and generates its own electric power. We do have an interchange agreement with the local power company.

I would like to state that we have referred to some of the benefits of the Aspen Reservoir. It will be testified to by others, and there are western Colorado benefits in the planning of this project as well as eastern Colorado.

I would like to call your attention to Senate Document No. 106, page 36, item 12. The appraised valuation of property in that area is much in excess of the item listed there by reason of a revaluation in the State of Colorado in 1952, and I fear that someone may take exception to the amount stated in this report.

I believe that the reports of repayment, as testified to by the members of the Bureau of Reclamation and by Mr. Aandahl this morning, indicated a much higher tax valuation than is shown there, because of the new valuation which was completed late in the year 1952, and you probably saw some of the repercussions.

Senator MILLIKIN. This is a sort of increment to the project?

Mr. CHRISTY. That is right, sir.

Other than my summary, I would like to make 1 or 2 comments, and that is that the project, to my knowledge, as a member of the policy and review committee, as included in the plan that has been presented to this committee, is exactly the same as the one we considered with the exception of the changes in the repayment made necessary by firming up the estimates of construction costs and bringing them down to a January 1953 date rather than 1949.

I would like also to mention that one of the affected States in their comments made in accordance with the provisions of the 1944 Flood Control Act specifically request the project be limited to the Fryingpan-Arkansas unit. I call your attention to page 2 of Senate bill 964, in lines 8 through 11, which refer to Senate Document No. 106, page 3, paragraph 4, article N, page 27, and item 83 on page 24 of this Senate document, all indicating that there is nothing implied in this project that additional units or expansion is considered or being requested.

Senator MILLIKIN. That was put in deliberately.

Mr. CHRISTY. Yes, sir.

I would like also to mention that in the deliberations of the policy and review committee, a very comprehensive and exhaustive study was made of the potential industrial requirements on the main stem of the Colorado River resulting in an allocation of part of the capacity of the Aspen Reservoir to meet any call on that drainage by reason of those potentials over there, and that will be testified to later by Mr. Tipton, or possibly Mr. Breitenstein.

As a member of that same policy and review committee, we reviewed the reports of the engineering advisory committee, and I know personally that there are records in the official files of the Colorado Water

Conservation Board indicating complete agreement between the State and Federal wildlife officials in connection with fish flows included in Senate Document No. 106.

In summary, the Arkansas Valley in Colorado is in desperate need of supplemental water supply for irrigation, municipal, and industrial purposes.

Full use has been made of existing water supply that is economically feasible for development by means of separate projects—this account of the difficulty of proper division of water under priority doctrine of water rights due to variations in timing of the runoff.

Possible reregulation of winter diversions, concentration of storage to reduce evaporation losses, as well as the proper use of new water from the Colorado River Basin, together with proper use of remaining flood runoff, must, of necessity, come through a large multipurpose project, including hydroelectric power, wherein the benefits can be divided throughout the whole Arkansas Basin in Colorado according to need.

Comprehensive study by the best engineers available has determined that the amount of water to be exported from the Colorado River Basin by the Fryingpan-Arkansas project is well within Colorado's share of the Colorado River under the various compacts; further, that quantity to be exported is so small as compared to the total flow of the Colorado River across the Colorado-Utah line as to have little effect on the quality of the water left in the Colorado River.

Further, the quantity of water imported to the Arkansas Valley is far below the supplemental needs in the Colorado-Arkansas Valley so that none of the water will cross the State line for use in States outside of the Colorado River Basin States as defined in the Colorado River compact.

Senator MILLIKIN. In other words, none of this water from the western slope will pass into Arkansas?

Mr. CHRISTY. Arkansas or Oklahoma.

There is one other statement I would like to make. There have been inferences in some of our hearings that this is a project pushed upon a people by the United States Bureau of Reclamation. I wish to state that the people in the Arkansas Valley asked the Bureau of Reclamation to come into our valley and make these investigations.

I also wish to call your attention to the fact that the reports and records in the plan have been fully considered by competent engineers in the State of Colorado other than the engineers of the United States Bureau of Reclamation. Studies have been going on on the final plan for better than 3 years. It is not something cooked up as a passing fancy. It is a result of long deliberation and determination by water experts, and I think it is feasible, and I urge your consideration.

Senator MILLIKIN. Thank you very much indeed. You have been an excellent witness.

We will insert your complete statement in the record.

(The statement referred to follows:)

A STATEMENT SUPPORTING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT PROJECT, BY HAROLD H. CHRISTY

For the purpose of identification, I am Harold H. Christy, 511 Polk Street, Pueblo, Colo. I was born at Colorado City, Colo., and have spent the major part of my life in Colorado. I was graduated from the Colorado School of Mines in 1922 and I am a registered professional engineer in the State of Colorado.

Since 1929 I have been employed by the Colorado Fuel & Iron Corp. at Pueblo as its chief engineer of the water department and for the past 5 years as superintendent of the water and power departments.

I have been a member of the executive committee of the Arkansas Valley Ditch Association since 1930 and a director of the Water Development Association of Southeastern Colorado since this association was organized. I was a member of the policy and review committee which was set up to investigate and make recommendations to the Colorado Water Conservation Board on the Fryingpan-Arkansas project, and also a member of the subcommittee which drafted the operating principles referred to in Colorado's comments, and the regional director in the United States Bureau of Reclamation's project report.

### ARKANSAS RIVER BASIN

The Arkansas River is formed by the East and Tennessee Forks which unite at Malta near Leadville. Elevations in the headwaters area range from approximately 9,400 feet at Malta to 14,400 feet on the highest mountain peaks. The river flows in a southerly direction joining with several high-altitude tributaries from the west and the south to its junction with the South Fork at Salida. Throughout the area from Malta to Salida and thence east to Canon City, the river flows through many narrow valleys and steep, rocky canyons.

Below Canon City (elevation 5,800) the river flows eastward through a valley which increases in width to its junction with the Fountain River at Pueblo (elevation 4,700), thence continues in an easterly direction across the high plains to the Colorado-Kansas line at an elevation of approximately 3,300 feet and some 340 miles from its source.

The Arkansas River Basin in Colorado comprises more than 25 percent of the total area of Colorado; however, the distribution of precipitation is such that the basin contains only about 7 percent of the State's water resources.

Settlement and development of the basin actually got underway in the late 1850's following the discovery of gold. Permanent settlement continued as new ore deposits were discovered in the headwaters area above Canon City. Irrigated agriculture development occurred almost simultaneously in the areas closest to mining development in order to provide food and fiber.

### DEVELOPMENT AND UTILIZATION OF WATER RESOURCES

During the early 1860's construction of small irrigating ditches occurred in the Canon City area and in the area downstream to a point approximately 30 miles east of Pueblo. Numerous small ditches on the tributaries and along the main stem of the river upstream from Canon City continue in operation to the present time. These individual enterprises were extended throughout the numerous narrow mountain valleys.

During the period 1859 to 1869 appropriations or decrees were perfected totaling some 1,475 cubic feet per second on the tributaries and an additional 1,776 cubic feet per second during the period 1870 to 1879. However, during the same period the records indicate appropriations were obtained on only 900 cubic feet per second on the main stem of the Arkansas River.

The first major development on the main stem occurred in 1874 in the Rocky Ford area. Interest in irrigation below Pueblo resulted in development and appropriations from the main stem of the river totaling approximately 3,000 cubic feet per second between 1880 and 1889 and an additional 3,000 cubic feet per second was appropriated during the following decade. During this period practically all small ditches east of Pueblo were consolidated or transferred to some major ditch system. These early priorities represent the dependable water rights in the consolidated systems as compared with the priorities established under these systems by reason of their construction.

Following the above development of irrigation systems supplied by direct flow rights, a few drouth seasons occurred, definitely establishing the need for supplemental water supply controlled for use during off-peak-flow periods. This resulted in the construction of numerous plains reservoirs fed by flash runoff from rains on the drainage above these reservoirs. Time again proved the inadequacy of this source of supply and subsequent decreases were obtained from the main stem of the river by reason of the enlargement of existing ditches or new ditches from the river to feed these reservoirs.

Three mountain reservoirs were constructed during this period and, together with the flood right ditches referred to above, controlled the high runoff of snow water in the spring as well as the flash runoff from heavy rains during July and

August. The records indicate that this period of storage development ended about 1910.

All the above-mentioned ditch and reservoir construction was accomplished by means of private capital. Comprehensive investigations will indicate that full development of water resources possible under private financing has been accomplished. In fact overdevelopment occurred as a ditch and reservoir on the Apishapa River was washed out by flood in 1923 and was never rebuilt. Stating this in another way, let's say that all single-purpose project development has been accomplished. This is true because the annual runoff from October to October of each year varies from a low of 195,000 acre-feet to a high of 933,000 acre-feet at Pueblo gage. The mean average annual runoff for the period 1910 through 1944 at Pueblo gage is on the order of 513,000 acre-feet.

During the period 1860 to 1910 the irrigated acreage increased from practically nothing to a peak of some 550,000 acres, and continued at approximately this amount until the late 1920's. The acreage under irrigation has been on the decrease since this time primarily on account of inadequate water supply to an average during the last decade of approximately 460,000 acres or a reduction in irrigated agriculture on the order of 80,000 acres. These figures are for the drainage basin. Reductions on the main stem of the river will account for the major portion of the decrease account of the development on the tributaries having a more dependable water supply.

Believe it is apparent that a main-stem reservoir of large capacity would be required to iron out the fluctuations from the minimum to the maximum as indicated above. Therefore, future beneficial development must of necessity be accomplished by the so-called multipurpose projects, that is, irrigation, flood control, sedimentation, and municipal supply. Projects of this type, due to the varied interests involved, are practically impossible of accomplishment under private financing.

The only increase in water supply since the first decade in 1900 has been the construction of some 6 small transmountain ditches each producing from 900 to 7,000 acre-feet annually. The total increase in water supply from 1910 to 1935, resulting from these transmountain ditches, was on the order of 10,000 to 12,000 acre-feet annually.

The first transmountain project of any size on the Arkansas River was constructed by the Twin Lakes Reservoir & Canal Co. known as Independence Pass transmountain diversion. This project was placed in operation in 1935 and since has contributed (depending upon runoff, of course) up to approximately 45,000 acre-feet annually. The Twin Lakes Reservoir & Canal Co. was forced to construct this project due to the drought in the early 1930's.

All of the above-mentioned projects were accomplished by private financing and were feasible single-purpose projects account of taking advantage of low mountain passes or existing railroad tunnels, except, of course, the Independence Pass project. The development of the above-mentioned projects has exhausted all possibilities available to the Arkansas River financed as a single-purpose project, forcing the consideration of multipurpose projects for the firming up of irrigated agriculture, municipal, and industrial supply.

The exception to the above-outlined development of water resources of the Arkansas Basin by private financing is the John Martin Reservoir project on the lower river which was constructed by the Army engineers and placed in operation in the early 1940's as a flood control and conservation project. Capacity in the John Martin Reservoir for carryover of the flash runoff, in addition to the flood requirements, is an excellent example of the benefits mentioned above in connection with large multipurpose projects.

### PROJECT INVESTIGATIONS

During the middle 1920's the major ditch companies along the Arkansas River below Canon City realized the absolute necessity of a supplemental water supply for irrigation as well as municipal purposes to protect the economy in the basin. Investigations as to the possibility of diverting surplus water from the headwaters of the Colorado River and its tributaries and the Arkansas River were initiated. These efforts were extended toward the complete investigation of the needs in the Arkansas Valley as well as a comprehensive investigation of the requirements in western Colorado to the end that an orderly development might be accomplished without injury to any part of the State of Colorado. All of these efforts were of no avail due to intrastate misunderstandings and local jealousy.

Finally, following the severe drought in the early 1930's, we were able to prevail on the United States Bureau of Reclamation to initiate investigations in the

Arkansas Valley to determine the need for additional water. Upon completion of these investigations in the Valley, the United States Bureau of Reclamation extended their work to investigations in western Colorado. The work by the Bureau covered water supply and future needs in western Colorado as well as the development of the amount of surplus water available for use in eastern Colorado. The information obtained by these investigations played an important part in Colorado's presentation as to its rightful needs in the deliberations leading up to the upper Colorado River Basin compact signed October 11, 1948.

Due to the delay in completion of the comprehensive investigations in western Colorado, particularly the main stem of the Colorado River, and the dire necessity for immediate relief for domestic and municipal requirements, as well as a supplemental supply for existing development in the Arkansas Valley, it was decided to set up a small complete diversion project from the tributaries of the Roaring Fork. This project, being in an area where investigations of the water supply had been completed, was designed as an independent project well within Colorado's share of water from the Colorado River under the upper basin compact. The design of the project is of such a nature that it can be molded into later complete development of any project outlined by the investigations on the Arkansas, Red, and White Rivers.

### DOMESTIC SUPPLY

During the period of agricultural expansion and the subsequent stalemate or backward trend, the human and livestock requirements for water in the valley were constantly increasing. Population in towns and cities increased from a trading-post state to thriving communities. Municipal and domestic requirements played some part in the reduction of water available for agriculture, particularly in the vicinity of the two largest cities in the area, Pueblo and Colorado Springs, these communities having a population in 1950 in the metropolitan areas approximating 90,000 and 60,000 respectively.

Growth of Colorado Springs led to their acquiring ditch rights along the Fountain River between Colorado Springs and Pueblo and the transfer of these rights to their headwaters reservoirs on the slope of Pikes Peak. This resulted in reduced irrigated agriculture along the Fountain River as evidenced by statistical record showing some 20,967 acres irrigated in 1929 as compared with 14,400 acres in 1949. These figures are for El Paso County and do not include any reduced acreage account of Colorado Springs transfer of water rights from Pueblo County.

Actually, no further transfer of rights along the Fountain can be beneficially accomplished as the natural flow at the Colorado Springs points of diversion is now fully depleted. The remaining agriculture in the area is being supplied by return flow from the city, some under flow and small flow from the lower tributaries.

Pueblo is supplied by 2 water districts which in the early days acquired 8.29 cubic feet per second of priorities dating 1870 to 1872, the acquisitions being by original construction or purchase of small irrigation rights. The districts also acquired decrees for 22.66 cubic feet per second in 1884 and 46 cubic feet per second in 1889. The combination of these rights proved adequate for the city's use until early 1920's at which time the trustees of the districts attempted to purchase additional irrigation priorities in the Canon City and Florence area. Two attempts at transfers were made but were refused by the courts. Following these activities the trustees negotiated a consent decree in 1930 with the major lower river ditch organization whereby they gave up 68.66 cubic feet per second of 1884 and 1889 priorities for 45 cubic feet per second of 1874 date. This trade was accomplished account of the ditch owners believing that the municipality had to have water and that the resulting action in reducing the total amount of diversion decrees would result in a gain for agriculture. The 1874 date, being considered a continuous flow decree, appeared to be a good trade to the trusties. However, had the low river flows of the next decade been known at the time of the consent decree, it is not likely that the ditch owners would have consented to the 1874 date.

The records will indicate several occasions when the river has ceased flowing at the south side dam at Pueblo. This dam is a part of the diversion works at Pueblo South Side Water Works, and also in the location of the official Pueblo gage on the river. During the year 1934 the river flow was reduced for a prolonged period necessitating the sinking of wells in the riverbed to obtain sufficient water to meet restricted municipal requirements. This water, of course, did not legally belong to the city and its quality was questionable. However, if you could stand the

chlorine taste, the water was wet and bacteria free as it entered the distribution system.

Following this experience, the trustees for the North Side Water Board, Pueblo, acquired a small transmountain ditch from the Eagle River, a tributary of the Colorado, as a supplemental supply. In the absence of reservoir storage space, this transmountain water has been stored by agreement in the Sugar Loaf Reservoir near Leadville.

Continued growth during the last war resulted in the city's being threatened with legal action by the lower river ditch owners account of over diversion of the city's rights. In 1950 the trustees again attempted to acquire some old irrigation rights for municipal use, but failed in their attempts due to ditch owner protests.

The above clearly indicates that Pueblo, as well as Colorado Springs, has depleted all of the available Arkansas River supply without condemnation proceedings of irrigation rights which would of course result in further reduction of agriculture production in the valley. These domestic requirements must be supplied from a source other than the Arkansas River. The Colorado River represents the only remaining source of supply available to the Arkansas River Basin.

Since the available supplies from the Colorado River drainage occur during high spring snow runoff, large municipal diversions will be necessary during short periods which in turn will require large storage reservoirs in the Arkansas drainage basin. Thus domestic requirements for the future are definitely tied to large multipurpose projects in order to provide orderly development.

The Fryingpan-Arkansas project design meets the municipal and domestic requirements east of Canon City due to the large holding reservoirs at high altitudes and the proximity of Pueblo to the terminal storage reservoir on the project. The terminal storage or Pueblo Reservoir, coupled with valley pipeline and treating plant, will provide water for future human consumption in Pueblo as well as the remainder of the Arkansas Valley towns. In planning a project of this nature, the human and animal requirements in the urban and rural areas must be considered. It is anticipated that numerous delivery points will be provided along the valley pipeline for service to urban and rural population. Drinking water throughout the entire valley area is of questionable quality and is presently hauled from the towns to the farm sites for human as well as livestock consumption.

Most of the towns east of Pueblo have depended on well supply. However, during late years some have been forced to sink wells in the river flood plain or divert and chemically treat ditchwater, the ditchwater being of much better quality insofar as hardness is concerned than the well water last mentioned. Well supplies are not dependable in the Arkansas Valley as to quality, continuous flow, and volume.

### PUEBLO RESERVOIR

This project reservoir located some 6 miles west and upstream from Pueblo constitutes a typical multipurpose unit of the Fryingpan-Arkansas project. Municipal development of this site as a single-purpose project could well result in detriment to future over all plans for basin benefits as only limited reservoir sites are available. The necessity for costly railroad realinement through the site also prohibits the use of the site as a single-purpose reservoir. Combined use of a site of this type results in lower unit cost and the pooling of storage interests at the site will result in lower surface evaporation losses thus conserving the limited water supply available.

The Pueblo Reservoir is absolutely necessary for flood protection to the city of Pueblo and the immediate reaches of the river below Pueblo unless large sums of money are expended in channel work on the Fountain and for miles downstream on the main river below the junction of the Fountain and the Arkansas. The time interval between floods of great magnitude tends to enhance destruction of property and life when they do occur account of the conditions of the channel.

Following the flood of 1921, at which time some 78 lives were lost and property damage of approximately $19 million occurred, the city of Pueblo formed a conservancy district. Under the auspices of this district, a flood channel through the city and a barrier dam were constructed at a total cost of from $9 million to $10 million to the local taxpayers. Again we find evidence of local interests having provided for their own protection without Government participation.

This conservancy district work provides a channel through the city with carrying capacity approximately 120,000 cubic feet per second. However, due to the conditions of the channel below town, competent engineers feel that a flow of approximately 60,000 cubic feet per second would inundate the present waterworks facilities, leaving the community of approximately 90,000 people without water for domestic consumption and fire protection.

Construction of the Pueblo Resevoir will control the flow through the flood channel to an estimated maximum of 25,000 to 30,000 cubic feet per second, this peak flow being the result of flash runoff on drainages tributary to the river between the reservoir and the waterworks systems.

The reservoir will also provide space for storage of winter flow, permitting the application of this water on crops during the growing season; also space for storage by agreement among the water users of water normally held in the lower plains reservoirs on which excess evaporation occurs. Any reduction in the evaporation naturally increases water for application directly to the crops or for municipal use. This storage of the winter flows and the exchange of storage from the plains reservoirs must be accomplished under the Colorado statutes by agreement among the water users. All of the larger ditch companies in the lower valley have signified their willingness and intention to work out such an agreement. Service charges on this type operation of the Pueblo Reservoir will provide the contracting agency with some additional funds for repayment to the Federal Treasury for expenditures on the project and represent possible additional security for the investment.

In addition to the above uses of the Pueblo Reservoir material benefits will be obtained in connection with sediment control, electric power and storage space for reserve domestic supply. Presently the reserve storage space in the Pueblo water systems amount to only 3 days maximum demand. It is apparent that a major revision in the city system must be made.

Some tentative plans to meet immediate emergency, but not of sufficient magnitude to correct the conditions, have been drawn by the trustees of the waterworks, but action has been deferred in order not to hinder or interfere in any way with overall basin development on the Arkansas River in Colorado. Pueblo is at present (without considering future normal growth) in dire need of additional water supply.

Federal regulations relative to uniform quality in connection with water supplied for use in interstate commerce will no doubt force the addition of a filtration plant, etc. Large expenditures of funds for these facilities, independent of some overall plan for the valley, would be false economy. A manufacturing and transportation center along the front range of the Rocky Mountains, together with the agricultural production including the local trade centers, certainly should warrant full consideration and opportunity to participate in the reclamation and flood control program of the Nation.

If for no other reason, the value of this area in case of war should be given serious consideration due to its geographic location, giving consideration to the location of an integrated steel plant and allied industries, together with one of the largest ordnance depots in the United States.

### INDUSTRIAL DEVELOPMENT

Pueblo, the trade center of the Arkansas Valley, is the location (since 1880) of the Minnequa plant of the Colorado Fuel & Iron Corp., an integrated steel plant. This is the major production unit of the ninth largest steel company in America. One of the major reasons for this plant being located at Pueblo was water supply. Due to the large quantities of water necessary to operate a steel plant, the corporation was forced to develop its own water supply. Its system consists of some 66 miles of ditches from the main Arkansas River and from the St. Charles River, together with storage reservoirs in the Pueblo area. The corporation also owns Sugar Loaf Reservoir located some 6 miles west of Leadville on the headwaters of the Arkansas River. The canal from the Arkansas River heads about 2 miles west of Florence and is 46 miles long, emptying into reservoirs south of Pueblo. The headgate was located in this area, due to the quality of the water available as the location is near the upper limits of limestone drainage to the river.

The water supply for this plant from the Arkansas River (as in the case of municipal supplies) was obtained in 1907 at the expense of agriculture. In other words, an old irrigation system was purchased, including land and improvements, and the water rights transferred to the corporation's point of diversion. The reservoirs, of course, were decreed by reason of construction and beneficial use. The steel plant's system supplies all of its industrial water, however, drinking water is provided from the city's system.

This system is mentioned in order to clear anyone's mind of the thought that the Fryingpan-Arkansas project will in any way subsidize a major industrial enterprise. Review of the report will indicate the corporation has agreed to cooperate with the United States Bureau of Reclamation or the conservancy district contracting for the project to the extent the corporation's Sugar Loaf Reservoir site

and land around this reservoir may be utilized so long as the vested rights of the corporation are not diminished or interfered with. You will note that storage space over and above the existing decree is to be paid for in the same manner as other reservoir sites used by the project.

The Colorado Fuel and Iron Corp.'s system is further mentioned as a typical indication of requirements for industrial water as expansion occurs in the area. For example, the use at the steel plant had increased to a daily requirement of approximately 32 million gallons per day in 1929. Modernization and expansion in the last 20 years has increased this demand to where the daily requirements approximate 60 million gallons. This demand being the requirements from the reservoirs and does not include the amount of repumping and reclaiming of water within the plant itself.

This plant produces many items required by the defense effort including shell steel, barbed wire, miscellaneous structural shapes, rails and fastenings, and with the completion of the tube mill, gun casings, as well as seamless tubes. Recent and planned expansion with new products will tend to draw allied industries to the area. These industries will require water for their use and their employees and, along with the corporation's use, will increase the demand for domestic water.

During recent years Pueblo and the Arkansas Valley have lost numerous industrial plants account of lack of water. For example: a paper mill requiring some 80,000 to 90,000 gallons of water per ton of production and a coal washing plant requiring some 200 gallons per ton of coal handled. Fall campaigns of existing sugar plants have experienced water shortages during the last decade, particularly during drought years. Feldspar, fluorspar, lead, zinc, manganese, ceramic materials, etc., are available in the Arkansas Basin in Colorado, all awaiting economic development as population increases and the markets build up. Development of these raw materials necessitates an increased water supply in order to provide for domestic consumption as well as processing. Without the Fryingpan-Arkansas project no water is available without further depletion of the agricultural supply which is already far below the normal requirements.

### POWER MARKET

Raw materials known to be available in the project area present a ready market for low cost power. Many of the coal and metal mines have been flooded out. Low cost power, particularly secondary power, could be consumed in unwatering these mines, thus restoring the economy of these areas.

Further, the Arkansas Valley presently is not tied in with any large electrical grid system whereby interchange or large blocks of standby power are available. This condition has made it necessary for each local system to provide capacity in excess of that required in an area where interchanges permit the pooling of surplus capacity to provide for emergency standby. This condition has to some degree prohibited installation of metallurgical furnaces in the area as demand rates of necessity must be higher if a single system reserve is required as standby.

### WESTERN SLOPE BENEFITS

The Fryingpan-Arkansas project, as described to you, consists of high altitude collecting system designed to divert surplus snow runoff to eastern Colorado without injury to western Colorado. In addition to the benefits in eastern Colorado, benefits will occur in western Colorado by the plan of operation developed during 3 years of investigation and study by the policy and review committee. This committee was composed of representatives of western and eastern Colorado and the director and consulting engineer of the Colorado Water Conservation Board. This committee at once recognized that dependable flow of the Colorado River was in some degree similar to that of the Arkansas, that is, high spring snow runoff and low flow conditions during the late growing season. Also, that recreational facilities of western Colorado areas must not be jeopardized, with the result that the Colorado Fish and Game Commission and the United States Fish and Wildlife Service were consulted and met with the committee in the planning of the project. The minimum streamflow schedules incorporated in project report "Operating Principles" were drawn up by the fish and wildlife agencies—this after numerous meetings and study of streamflow, etc. Also that existing vested rights for the Independence Pass transmountain diversion acquired under Colorado statutes would under full development interfere with fish culture in the Roaring Fork. Further, that few good reservoir sites were available in western Colorado. Therefore, any program of development must fully evaluate the overall benefits in any plan for the utilization of the site.

With these basin conditions recognized, the policy and review committee established an engineering subcommittee consisting of engineers from western Colorado, engineers from regions 4 and 7 and the Planning Division of the Bureau of Reclamation and the chief engineer and consulting engineer of the Colorado Water Conservation Board. Review of all available stream flow data indicated the feasibility of the Aspen site for a project reservoir in western Colorado. This site was chosen in order to permit full diversion of existing and future decrees on the Roaring Fork during the late summer months or at the end of the growing season. Provision was made for full irrigation of all available land in this area. A plan was devised permitting exchange with the Twin Lakes Independence Pass transmountain diversion project in order to protect the recreational features on the Roaring Fork under full development of this project, it being remembered that this project owns existing rights under the Colorado statutes.

By using the exchange features of the Aspen Reservoir, a plan was developed for maintaining the minimum flows required for fish and wildlife as recommended by the Colorado Fish and Game Commission in conjunction with United States Fish and Wildlife Service.

These engineering studies of the runoff condition definitely indicated that during many years of record the existing ditches in the Aspen area would have been unable to divert the full amount of their decrees at the end of the growing season as mentioned above. This is not generally of public knowledge as the present development in this area has not required full diversion by these ditches. By providing the exchange mentioned above, the requirements in the Aspen area have been protected and enhanced to meet complete development of the resources of the area.

Under the Colorado law, no replacement or compensatory storage on the Colorado River drainage is required unless the project sponsors elect to build such storage in order to permit longer continued diversions by providing exchange during periods their rights are junior to the requirement of senior appropriations in western Colorado. Reservoirs of this type are mandatory under some types of multipurpose development, for example, in connection with projects constructed under the Colorado Conservation District law.

SUMMARY

In conclusion, the Arkansas Valley in Colorado is in desperate need of supplemental water supply for irrigation, municipal and industrial purposes.

Full use has been made of existing water supply that is economically feasible for development by means of separate projects—this account of the difficulty of proper diversion of water under priority doctrine of water rights due to variations in timing of the runoff.

Possible re-regulation of winter diversions, concentration of storage to reduce evaporation losses, as well as the proper use of new water from the Colorado River Basin, together with proper use of remaining flood runoff, must of necessity come through a large multipurpose project, including hydroelectric power, wherein the benefits can be divided throughout the whole Arkansas Basin in Colorado according to need.

Comprehensive study by the best engineers available has determined that the amount of water to be exported from the Colorado River basin by the Fryingpan-Arkansas project is well within Colorado's share of the Colorado River under the various compacts; further, that quantity to be exported is so small as compared to the total flow of the Colorado River across the Colorado-Utah line as to have little effect on the quality of the water left in the Colorado River.

Further, the quantity of water imported to the Arkansas Valley is far below the supplemental needs in the Colorado-Arkansas Valley so that none of the water will cross the State line for use in States outside of the Colorado River Basin States as defined in the Colorado River compact. In addition, should a climatic change occur, there are thousands of acres of good land in the Arkansas Valley in Colorado not presently irrigated so no one need fear that Colorado will permit any of the Fryingpan-Arkansas project water to pass out of the State unused.

I respectfully urge your committee to give this project your full and favorable consideration.

Senator MILLIKIN. Mr. Ducy, whom do you want to put on now? We will hear one more witness and then we will recess until tomorrow.

Mr. DUCY. Senator, we feel we are imposing upon you to a very great extent. I believe Mr. Cooper of Las Animas, one of our outstanding farmers, has a statement that is not too long.

Senator MILLIKIN. We also have another group from the State of Washington. They want to be heard also. We will try to finish the Colorado business. If we do not finish, we may have to have a little recess so we can hear the Washington people, so let us do as much as we can today.

## STATEMENT OF ROY D. COOPER, LAS ANIMAS, COLO.

Mr. COOPER. I am Roy D. Cooper, a farmer of Las Animas, Colo. I have lived on an irrigated farm my entire life. I have carried and used an irrigation shovel ever since I was big enough. I operate 720 acres of irrigated land. On the average, I feed 3,000 lambs and 300 steers annually.

For the past 10 years I have been a member of the Board of Directors of the Fort Lyon Canal Co., which is one of the largest, if not the largest, irrigation systems in Colorado.

The section of the main stem of the river between La Junta and Lamar has approximately 100,000 acres of irrigated land. It is made up of three separate irrigation systems, namely, Las Animas Consolidated Canal, Las Animas town ditch, and the Fort Lyon Canal. The Las Animas town ditch has no water shortage due to an early priority and small limited acreage. The Las Animas Consolidated ditch and the Fort Lyon Canal have approximately equal shortages and crop similarities. Of the three above-mentioned systems, the Fort Lyon Canal has approximately 90 percent of the total acreage; and also has approximately 30 percent of the total acreage of the main stem of the Arkansas Valley which is irrigated. Using the Fort Lyon Canal data as a basis to compile the following figures and statements, would in turn be an approximate picture of this entire section.

Fort Lyon Canal system: This system comprises the Fort Lyon Canal, Fort Lyon storage canal, Horse Creek supply canal, Adobe Creek supply canal, Horse Creek and Adobe Creek Reservoirs.

The Fort Lyon storage canal, Horse Creek supply canal and Adobe Creek supply canals are feeder canals for Horse Creek and Adobe Creek Reservoirs.

Water stored in the above reservoirs is released through outlet ditches to the Fort Lyon Canal which is the distribution canal for the system.

Senator MILLIKIN. Is the canal owned by the irrigators?

Mr. COOPER. That is right.

This canal diverts water from the Arkansas River approximately 3 miles west of La Junta, Colo., on the north side of the river at a location known as the point of rocks and runs in a northeasterly direction for 105 miles to its terminus which is 7½ miles north and 2 miles east of Lamar, Colo., and irrigates 93,000 acres which comprise 419.18 farm units.

Principal crops: These crops are alfalfa, corn, and cereals. A limited acreage of onions, potatoes, and sugar beets are grown each year, but generally on land where underground water is available for pumping. During a part of the growing season, the supply in the Fort Lyon Canal is so short that water cannot be supplied often enough for growers of onions, potatoes, and sugar beets to produce the best results, unless storage water is available.

Water supply: The flow of the Arkansas River available for the Fort Lyon Canal is very erratic. During the greater portion of the

year, the first decree of 165 feet is diverted. The second and third decrees, which make a total of 933 second-feet, are only available during the period of snow runoff from May 15 to July 1 and at times of heavy rainfall over the drainage basin above the Fort Lyon Canal. During the summer months, the river is subject to sudden rises of short duration from rain and during these periods the river flow at the Fort Lyon headgate may vary from several thousand to ten to fifteen thousand second-feet.

Due to the erratic flow into the Fort Lyon Canal, the farmers apply more water than necessary during periods of high flows in the canal because they do not know when the supply will diminish.

If the supply of the water to be diverted could be controlled by a reservoir upstream, it would be possible to make a more efficient use of the water.

The following table is composed of figures and data kept by the Fort Lyon Canal system. The table gives the yearly diversions, the gross duty based on the present irrigated acreage, and the total yearly shortages in acre-feet on the assumption of a gross duty of 3 acre-feet for the acreage irrigated under the canal.

As used herein, the gross duty is the total amount diverted from all sources—river and water from storage. In compiling the following table, it does not take into consideration any transmission losses in the main canal or laterals from it, or temperature losses, or variations in precipitation.

The average annual shortage in years of normal precipitation based on a gross duty of 3 acre-feet amount to 70,000 acre-feet which if available would give this system a firm, controlled water supply.

A glance at the table will show that during the period from 1931 to 1940, inclusive, the diversions were extremely low. This period is known as the dustbowl period.

This table also shows the necessity for additional water for this system and the controlling of the same by storage upstream.

Senator MILLIKIN. How long has your water been extremely short down there? It seems to me you have had a lot of trouble with water in the last few years.

Mr. COOPER. That is right.

Senator MILLIKIN. How long has that been going on?

Mr. COOPER. As I say, there, through "the dirty thirties," as it is spoken of down there, it was extremely short. Then there was a short period there of 4 or 5 years that it was fairly good, and now in the past 3 or 4 years it has been very short and we are extremely short at the present time.

Senator MILLIKIN. I saw a picture recently of the man behind the Martin Dam. It showed the bottom of the dam with all of the earth all cracked up. When was that, last year?

Mr. COOPER. This year. It is dry now.

I will not go over all of this table.

Senator MILLIKIN. We will incorporate it in the record.

(The table referred to is as follows:)

*Fort Lyon Canal System*

| | Total amount diverted in acre-feet for irrigation | Gross duty acre-feet for 93,000 acres irrigated | Total shortage in acre-feet based on 3 acre-feet gross duty for 93,000 acres |
|---|---|---|---|
| 1916 | 250,395 | 2.69 | 28,605 |
| 1917 | 216,708 | 2.33 | 62,292 |
| 1918 | 229,574 | 2.47 | 49,422 |
| 1919 | 266,977 | 2.87 | 12,023 |
| 1920 | 286,560 | 3.08 | [1] 7,560 |
| 1921 | 191,779 | 2.06 | 87,221 |
| 1922 | 224,453 | 2.41 | 54,547 |
| 1923 | 193,135 | 2.08 | 85,865 |
| 1924 | 227,376 | 2.44 | 51,624 |
| 1925 | 181,286 | 1.95 | 97,714 |
| 1926 | 218,377 | 2.35 | 60,623 |
| 1927 | 208,987 | 2.26 | 69,013 |
| 1928 | 230,826 | 2.48 | 48,174 |
| 1929 | 248,471 | 2.67 | 30,529 |
| 1930 | 236,214 | 2.54 | 42,786 |
| 1931 | 154,728 | 1.66 | 124,272 |
| 1932 | 163,771 | 1.76 | 115,229 |
| 1933 | 203,251 | 2.18 | 75,749 |
| 1934 | 100,673 | 1.08 | 178,327 |
| 1935 | 200,685 | 2.16 | 78,315 |
| 1936 | 232,119 | 2.50 | 46,881 |
| 1937 | 182,470 | 1.96 | 96,530 |
| 1938 | 236,480 | 2.54 | 42,520 |
| 1939 | 143,079 | 1.54 | 135,921 |
| 1940 | 104,013 | 1.12 | 174,987 |
| 1941 | 250,662 | 2.69 | 28,338 |
| 1942 | 265,724 | 2.86 | 13,276 |
| 1943 | 215,613 | 2.32 | 63,387 |
| 1944 | 218,881 | 2.35 | 60,119 |
| 1945 | 218,449 | 2.35 | 60,551 |
| 1946 | 209,793 | 2.26 | 69,207 |
| 1947 | 245,792 | 2.64 | 33,208 |
| 1948 | 263,314 | 2.83 | 15,686 |
| 1949 | 252,246 | 2.71 | 26,754 |
| 1950 | 231,681 | 2.48 | 48,319 |
| 1951 | 208,968 | 2.25 | 70,032 |
| Total | | 2.28 | 66,960 |

[1] Overage.

Mr. COOPER. The table goes from the year 1916 to the year 1951, but I will point out a factor or two in here.

During that period there was only 1 year, in 1920, that there was an overage. In all the other years there was a shortage, and there are as many as 4 or 5 places here where there is only 1½ feet, and the average of course, as you will see, is 2.28.

A recent survey was sponsored by the Water Development Association of southeastern Colorado under the direct supervision of farmers which facts were recorded and tabulated.

Under the Fort Lyon Canal system, 30 farmers of average crop-production ability were interviewed individually. A comparison was made of acreages and yields under present water conditions with supplemental water conditions based on an average range of the period from 1939 to 1944, inclusive.

The data showed that a lack of adequate water caused a gross loss of $24.24 per acre, or a net loss of $10.72 per acre. Over the entire system, this would show a gross loss of $2,013,319.29, or a net loss of $890,481.26 per annum.

The difference of $1,122,838.03 is a direct loss of income to the community in the form of labor, machinery and supplies. Also, the increased activity created within the community by additional water would create a more stable and year-around economy which is im-

possible to measure in dollars and cents. Much of the losses I have mentioned can be avoided by the Fryingpan-Arkansas project.

This survey showed there would be an increase in diversified crops such as onions, beets, potatoes, and tomatoes. These crops show a higher net loss per acre due to the shortage of water. For example, the average gross income from an acre of alfalfa is $59.30; from that of an acre of onions, it is $575. This shows a difference of $515.70. With a meager 1 percent increased acreage of one of these diversified crops, such as onions, there would be an approximate increase of 830 acres which would gross $477,250, or approximately one-half million dollars. Since this locality has ideal climatic and soil conditions to raise these diversified crops, it is a shame this terrible loss exists due to the shortage of available water.

It is also true that there is as high as 50 percent loss on certain crops that require the entire climatic growing season of this section of the country to produce a crop. These crops may be held back 30 to 50 days early in the spring due to a lack of water or retarded 30 to 50 days at the end of the season from the lack of water. That condition exists under the present water supply; for example, alfalfa should yield on the average $59.30 per acre which in a dry time takes a 50 percent loss amounting to $29.65 per acre. This multiplied by the total acreage of 37,056.27 shows a gross loss of $1,098,727.41. Figuring corn, sugar beets, and barley in the same way, the resulting losses are: corn, $380,585.90; sugar beets, $184,086; barley, $88,155.25.

Fort Lyon records 1916–52 show approximately a 30-percent loss of storage water by seepage through storage canals and by evaporation from shallow storage basins in this plains area of hot and arid climate. If all water available could be stored upstream, data shows the 30-percent loss could be decreased to 1 percent. The Fryingpan-Arkansas project would make this saving possible.

It is very difficult to actually measure the value of winter irrigation. At the present time, winter water is applied on ground that has been plowed in the fall and is very hard and cloddy. It does not carry enough moisture to freeze and mellow down so it can be worked into a good seedbed in the spring. If we had additional water in the late summer, this fall-plowed ground would carry enough moisture for freezing and thawing and would be in good condition without winter irrigation. Also, we now have to water perennial crops in the wintertime so they have sufficient moisture to start their growth early in the spring. If they had sufficient water late in the summer or early fall, they would not need to be irrigated during the winter time. So it is my belief that if we had additional water for late summer or early fall and early spring irrigation, we could store the water which we now apply on the ground in the winter time.

Under our present system, the Fort Lyon Canal now diverts on the average, during the winter months, 35,000 acre-feet of water which, I believe, is at times 50 percent to 75 percent lost or wasted. If this water could all be stored and in turn used in the late fall and early spring, we could realize almost a hundred percent efficiency. The Fryingpan-Arkansas project would also make this saving possible.

There are vast areas of land that can be made no better by man's ability, but here is one that can by obtaining additional water by transmountain diversion. A better use can be made of the water

available if controlled by a storage reservoir on the Arkansas River above Pueblo.

There has been some talk here in regard to the farmer's ability to pay. In behalf of the Fort Lyon canal and ditches in the neighboring area it is my opinion that the farmer of the Arkansas Valley would be very willing to pay the $5.40 per acre-foot as proposed as a firm guarantee that crops can be brought to maturity and harvested without the risk inherited in farming in the valley during the past 50 years.

Also, as chairman of the repayment committee which was carried on in that valley in the past 2 or 3 years, I sat in very many meetings held with the different farmers up and down the valley, and it was the opinion of all these farmers that they would be willing to pay this for supplemental water.

To further substantiate the willingness of the farmers, there is the fact that there are farmers sent here by the farmers to support the project, and there are not any here to oppose it.

Also in regard to the amount of this project that is allocated to the farmers to pay back, I would like to make one comment on that. I think it is supposed to be approximately $125 or $135 an acre. At the present time in our community there and in the valley, there are irrigating wells being put down there where the water is available. It is a very small area close to the river, and does not have very large acreage, if they can get that.

Senator MILLIKIN. That is liable to run out, too, is it not?

Mr. COOPER. Yes. There are wells being put down at a cost of $4,000 on as small an acreage as 80 acres. If you figure the depreciation, and they will probably last about 20 years, that would be 2½ times in the period of 50 years what this is figured on. That would mean they would have $125 in pumps and wells.

Senator MILLIKIN. If the farmer does not lose his water table.

Mr. COOPER. Yes, and it costs approximately $1.50 an acre to irrigate, just to pump that pump after you get it, and two irrigations or three-tenths of a foot that it requires to each irrigation would mean approximately a half foot, which is the same amount of water that this project proposes to divert over there. That would be also a cost of $3 an acre over a period of 50 years, which is $150, and $150 and $125 is $275, and the bankers up and down the valley that know the ability of that country to produce are now loaning money to these farmers to put these wells down.

Senator MILLIKIN. You have no other alternative source of water except the pump and the water that you would get by this project; is that right?

Mr. COOPER. Yes, and the pumps are very limited.

Senator MILLIKIN. And this water that you would get by this project is a necessary additional source of water in order to finish off these crops?

Mr. COOPER. That is right.

Mr. DUCY. Senator, if you do not mind, Mr. Cooper mentioned the fact that he acted as chairman of our repayment committee making a study. His committee went to a great deal of trouble producing maps showing the exact acreage of the study and the names of the farmers.

I thought, in connection with his statement, he would like to submit those for your files.

Senator MILLIKIN. We will put those in the record.

(The maps referred to face this page.)

Senator MILLIKIN. Let me ask another question. You referred to the fact that you were a member of the board of directors of the Fort Lyon Canal Co. Are you speaking for the board of Fort Lyon Canal Co.

Mr. COOPER. I am.

Senator MILLIKIN. Without any question?

Mr. COOPER. Without any question. I was sent here by the Fort Lyon Canal Co. and am speaking in behalf of them.

Senator MILLIKIN. And they knew what you were going to say?

Mr. COOPER. Yes.

Senator MILLIKIN. Thank you very much indeed.

Do you have a witness who has a short statement?

Mr. DUCY. I can give you Mr. Ted Ryan, a farmer who came down with us. Mr. Ryan is from Rocky Ford, Colo.

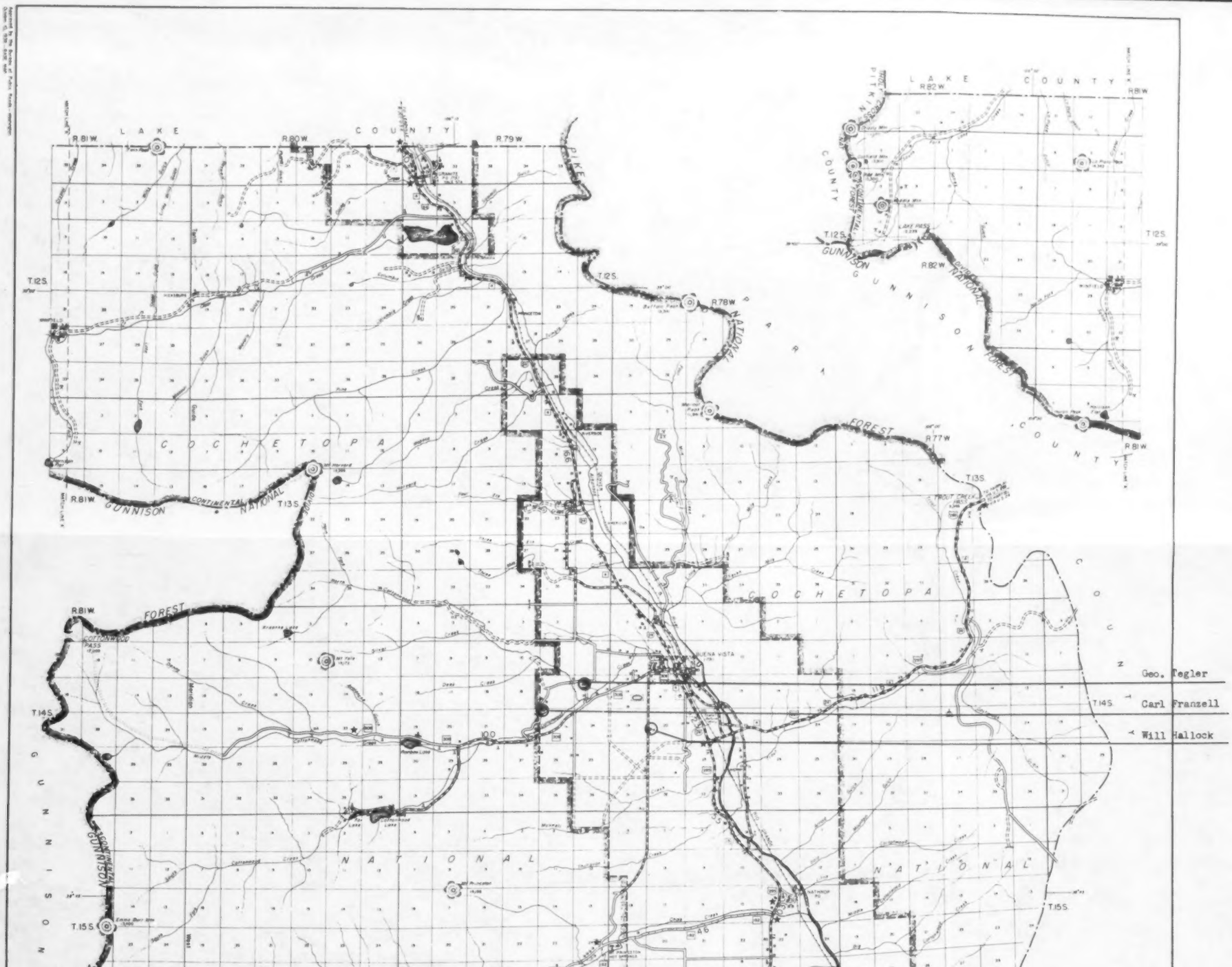
Senator MILLIKIN. All right.

## STATEMENT OF TED R. RYAN, ROCKY FORD, COLO.

Mr. RYAN. I am Ted R. Ryan of Rocky Ford, Colo. I have lived in the Arkansas Valley in Colorado for 48 years and have been actively engaged in farming there for more than 30 years. My family has been engaged in the production and sale of Rocky Ford cantaloup and other vine-crop seeds, as well as general farming, for about 50 years. I have been a director of the Catalin Canal Co. for 20 years. I am here to present the situation of the farmer in the central part of the Arkansas Valley in Colorado.

I shall speak first of the general water shortages that prevail in my area, second of the particular shortages under two representative irrigation ditches, and third of the farming conditions and methods that result from these shortages, and finally of how these matters would be altered by the addition of water from the Fryingpan-Arkansas project.

The surveys conducted by the Water Development Association of Southeastern Colorado, assisted by the Pueblo office of the Reclamation Bureau, show the chronic shortage in irrigation water supply. These surveys also show the economic losses that result from this shortage. In these surveys more than 300 farmers prepared and presented detailed budgets of their present operations, They then prepared budgets to show the estimated production and expense with a complete supply of water. More than 150 ditch officials also assisted in this work. Not all irrigation ditches are affected alike, however. A few of the older ditches, holding the earliest priority rights, are not much affected by the short supply of water. Other ditches suffer from the shortage in the early spring before the mountain snows begin to melt, and again in late July and early August when all the mountain snow is gone. It is during both of these periods when the water is most urgently needed, because in the spring the water is needed to start the newly planted crops and because, in July and August, the water is needed to counteract the high temperatures. These two periods of shortages have varying effects on the ditches, for some with poorer water rights suffer greater shortages over longer periods of time.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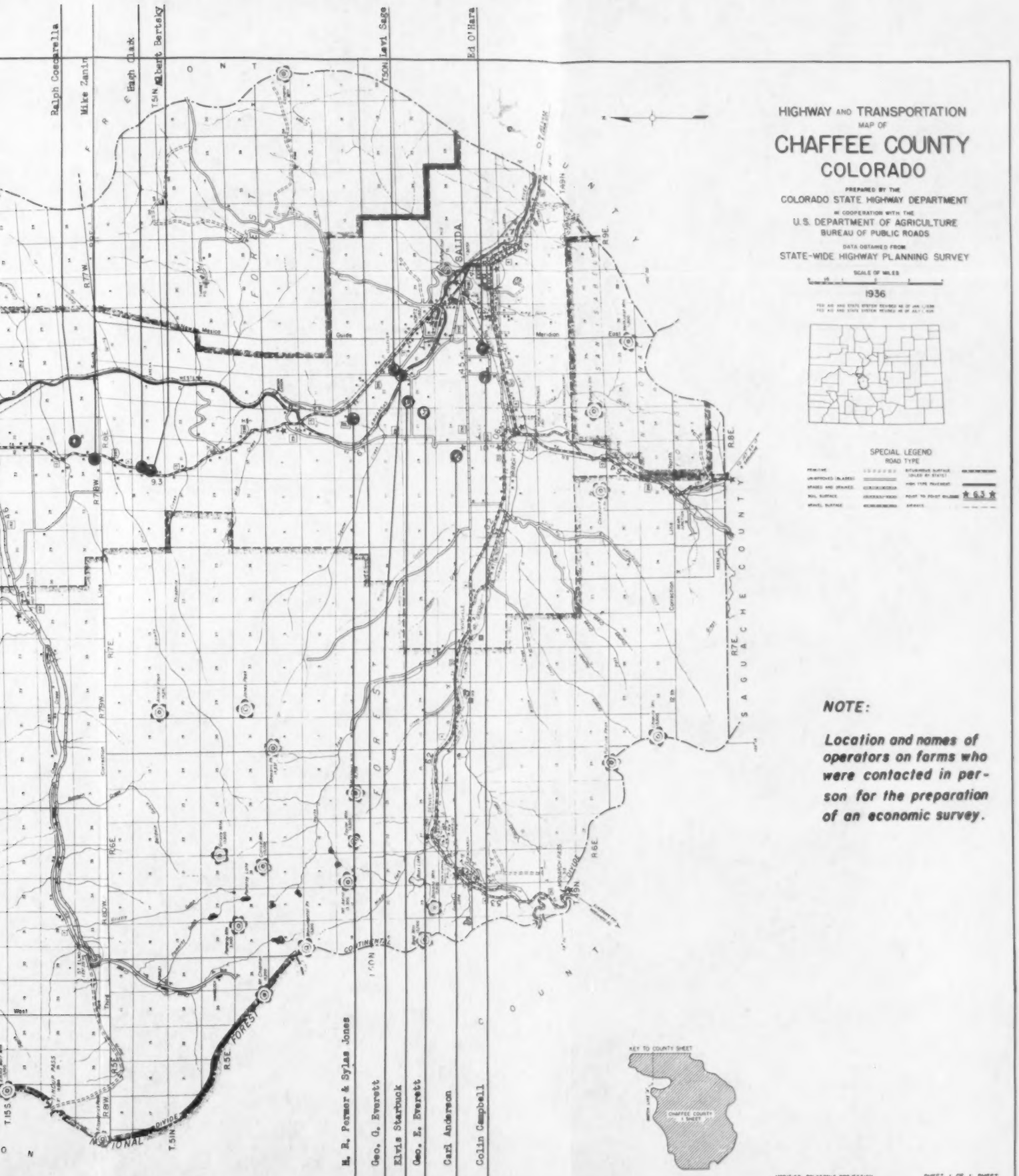
PIKE NATIONAL FOREST
Geo. Tegler
Carl Franzell
Will Hallock




HIGHWAY AND TRANSPORTATION
MAP OF

# CHAFFEE COUNTY
## COLORADO

PREPARED BY THE
COLORADO STATE HIGHWAY DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DATA OBTAINED FROM
STATE-WIDE HIGHWAY PLANNING SURVEY

SCALE OF MILES

1936

SPECIAL LEGEND
ROAD TYPE

***NOTE:***

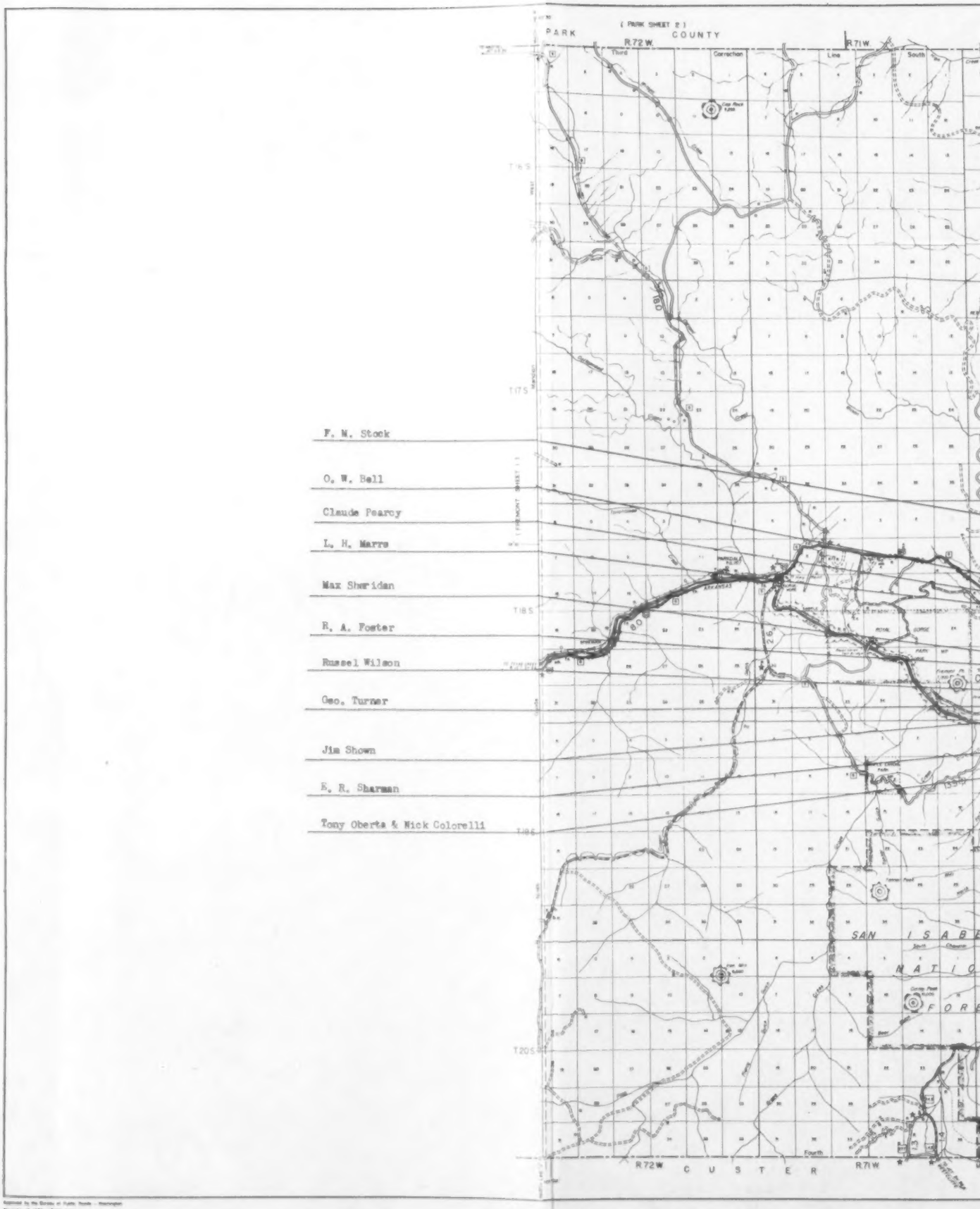
***Location and names of operators on farms who were contacted in person for the preparation of an economic survey.***

MODIFIED POLYCONIC PROJECTION

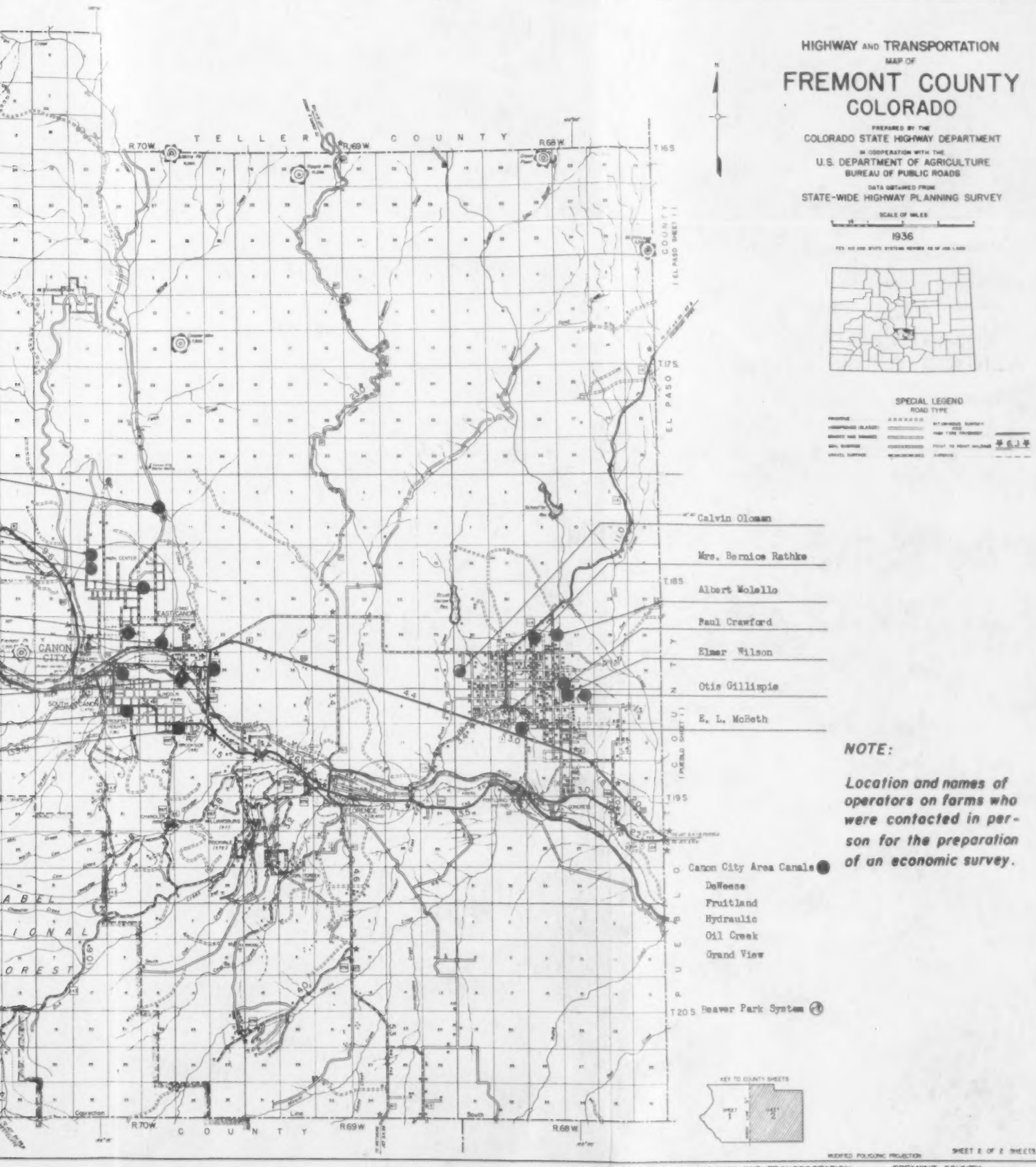
SHEET 1 OF 1 SHEET

HIGHWAY AND TRANSPORTATION MAP OF CHAFFEE COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 1

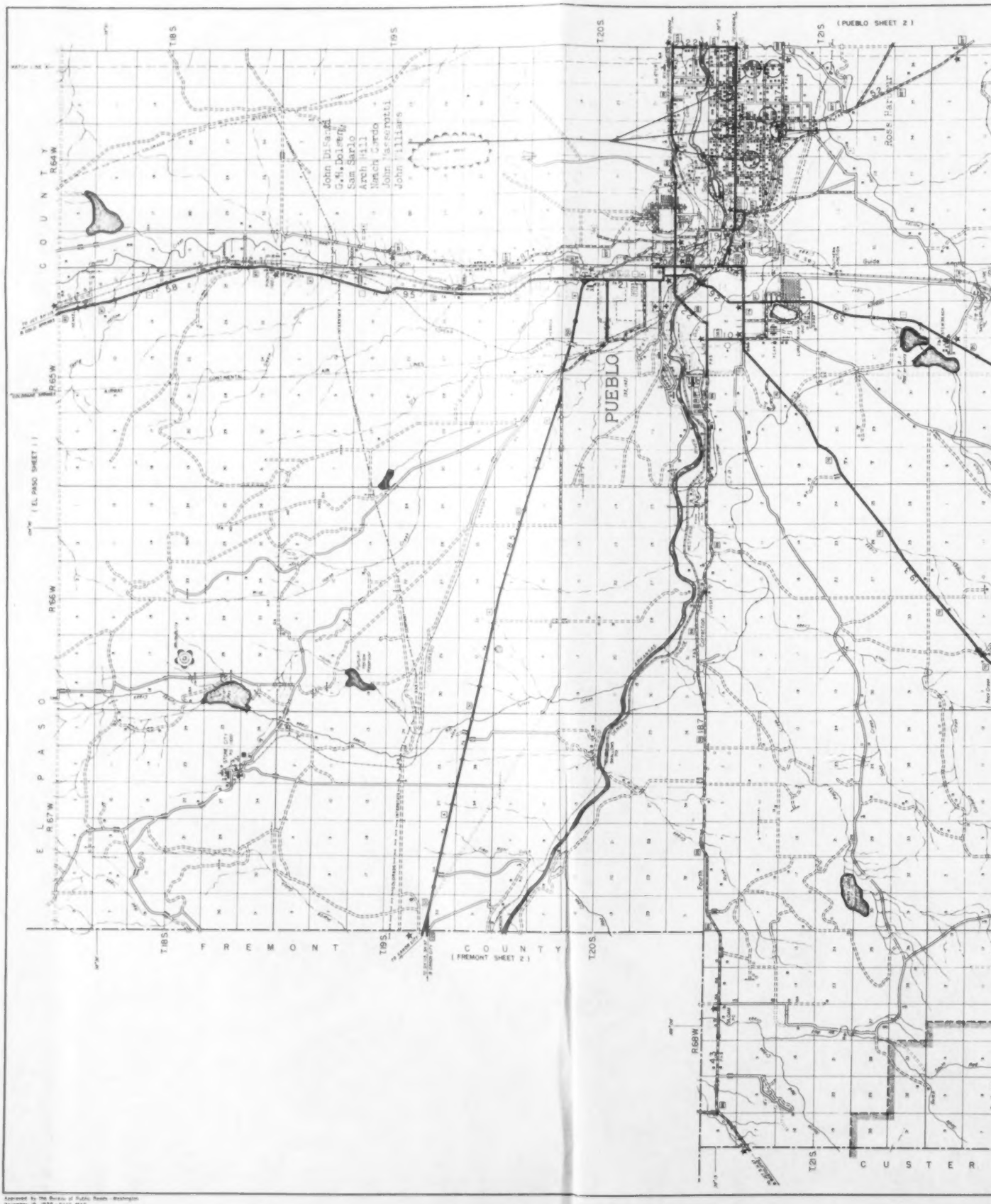



Approved by the Bureau of Public Roads - Washington
November 15, 1939 - Basic MAP

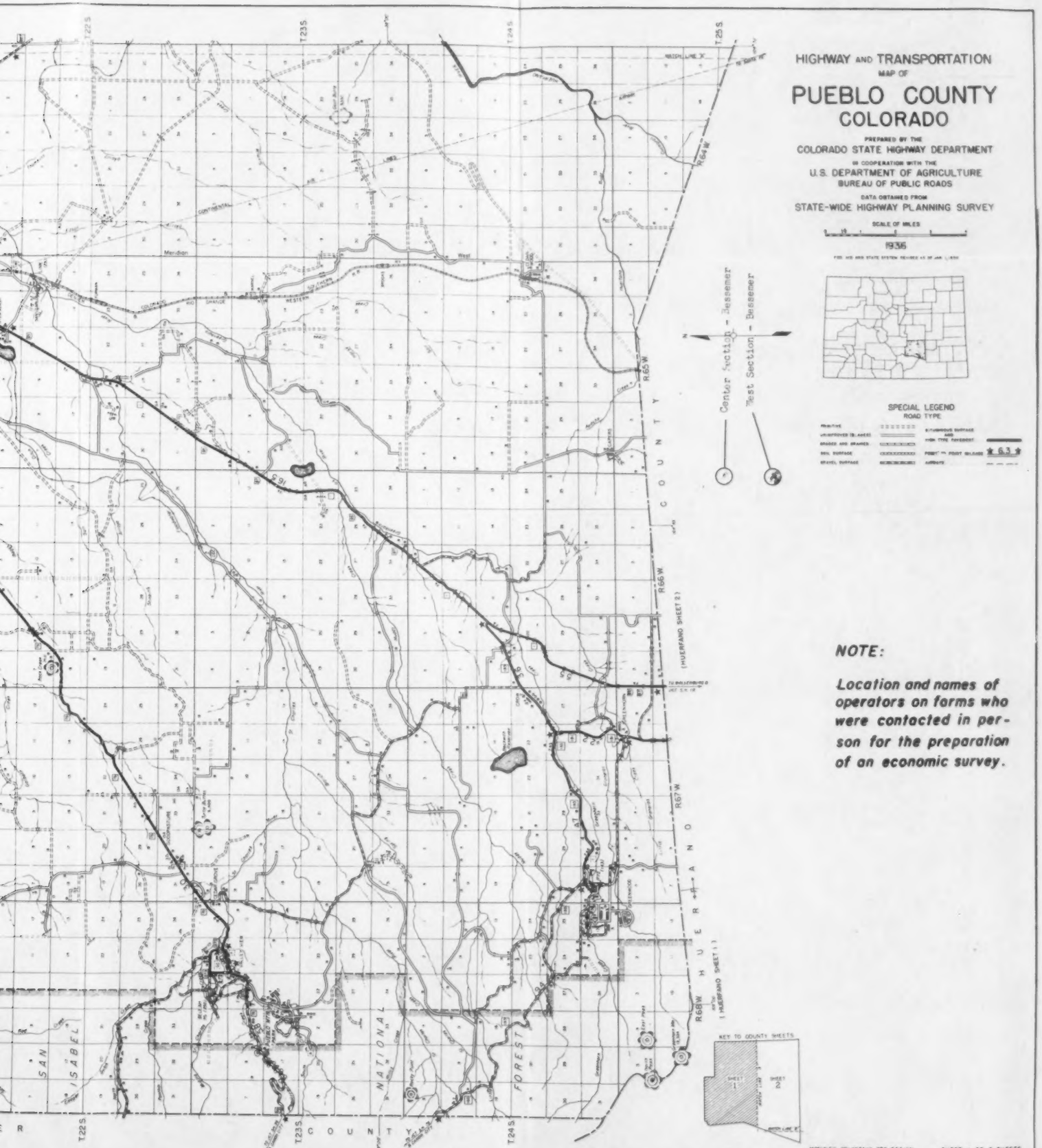



HIGHWAY AND TRANSPORTATION MAP OF FREMONT COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 2

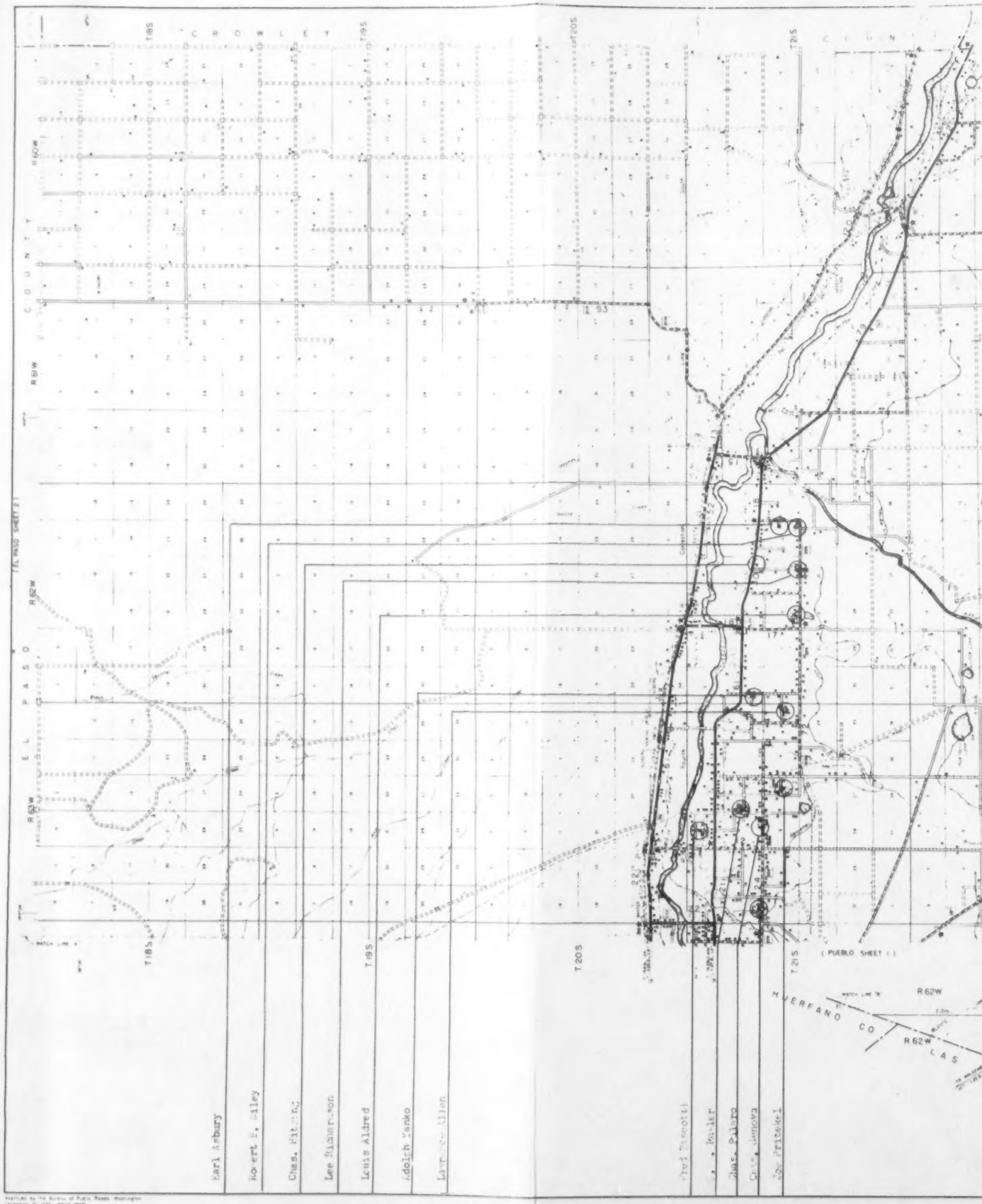



Approved by the Bureau of Public Roads - Washington
December 15, 1938 - BASE MAP




HIGHWAY AND TRANSPORTATION MAP OF PUEBLO COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 3


C R O W L E T
C O U N T Y
E L P A S O
T18S
T19S
T20S
R61W
R62W
(EL PASO SHEET 2)
(PUEBLO SHEET 1)
HUERFANO CO.
R62W
Earl Asbury
Robert E. Alley
Chas. Fitting
Lee Richardson
Louis Aldred
Adolph Panko
Fred Pignotti
Jas. Pilaro
Cora Jenova
Joe Pritekel

# HIGHWAY AND TRANSPORTATION MAP OF PUEBLO COUNTY COLORADO

PREPARED BY THE
COLORADO STATE HIGHWAY DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DATA OBTAINED FROM
STATE-WIDE HIGHWAY PLANNING SURVEY

SCALE OF MILES

1936

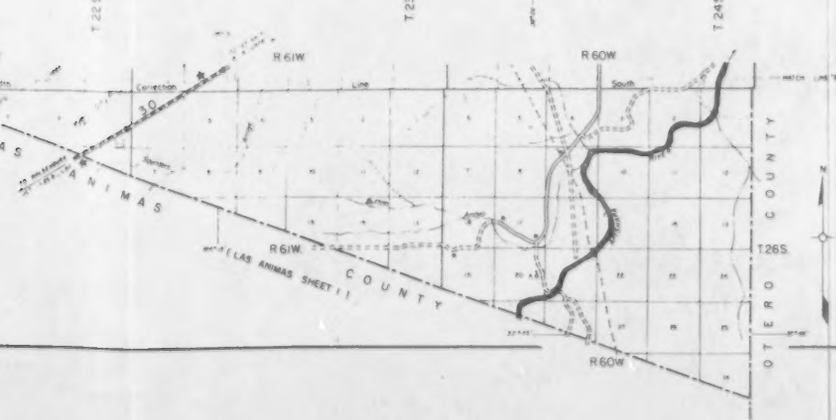
FED. AID AND STATE SYSTEM REVISED AS OF JULY 1, 1936

SPECIAL LEGEND
ROAD TYPE

PRIMITIVE
IMPROVED GRADED
GRADED AND DRAINED
GOOD SURFACE
GRAVEL SURFACE
BITUMINOUS SURFACE AND HIGH TYPE PAVEMENT
ROAD TO FORT WILKINS ★ 63 ★
AIRPORT

**NOTE:**

***Location and names of operators on farms who were contacted in person for the preparation of an economic survey.***



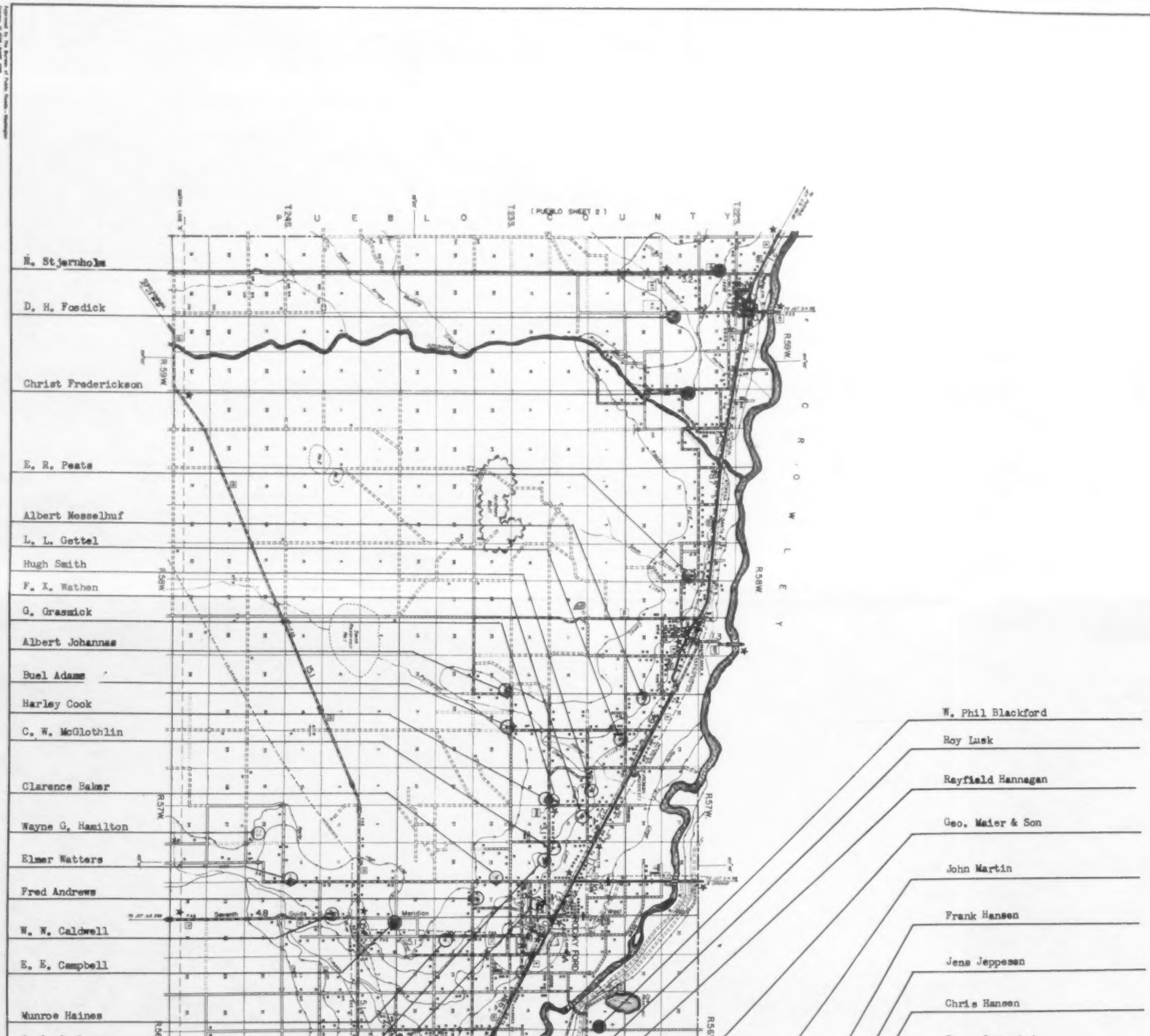

Rocky Ford Highline
East Section - Pearsmar
Center Section - Deserant

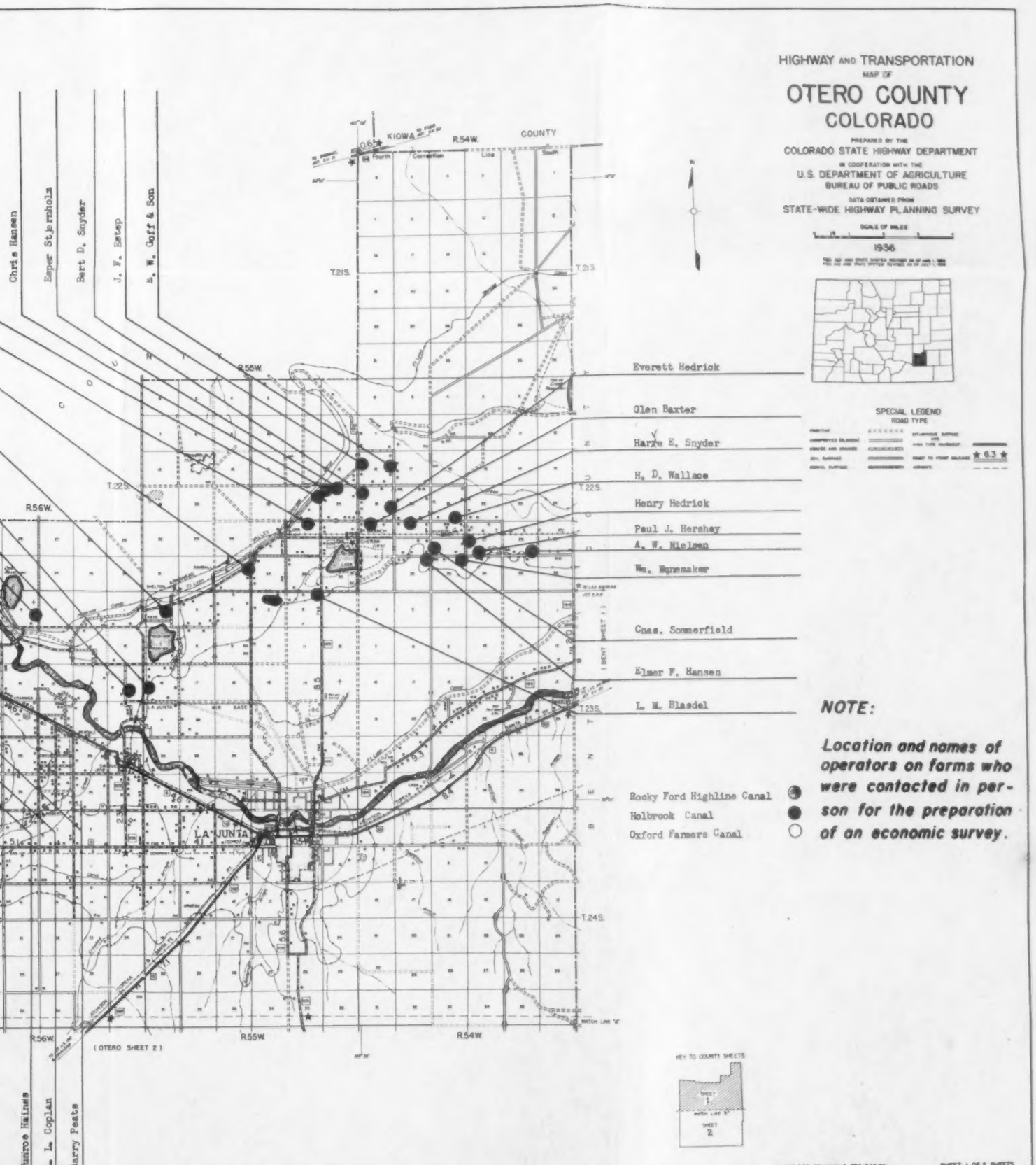
MODIFIED POLYCONIC PROJECTION

SHEET 2 OF 2 SHEETS

HIGHWAY AND TRANSPORTATION MAP OF PUEBLO COUNTY COLORADO

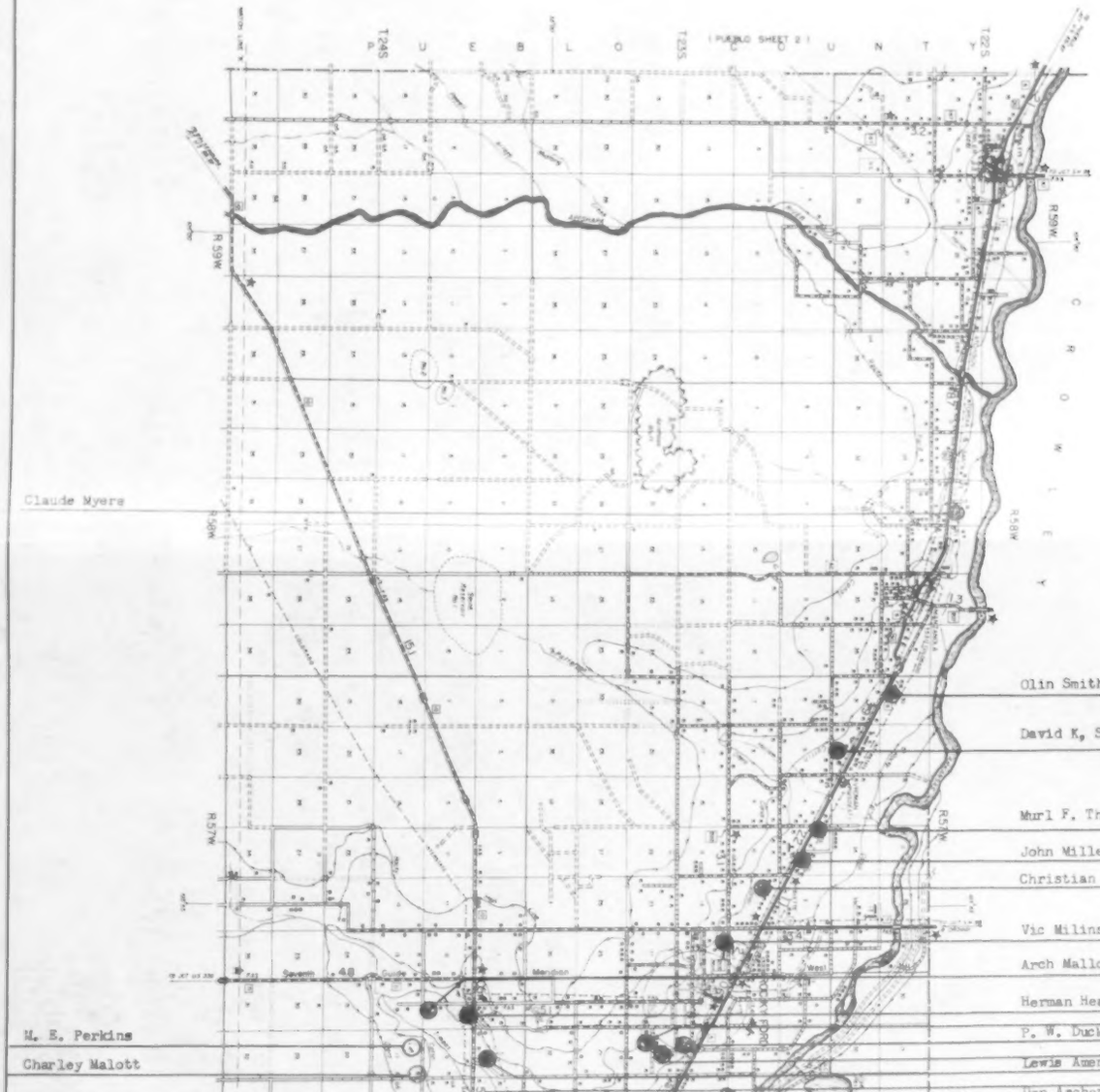
49438 O - 54 (Face p. 166) No. 4

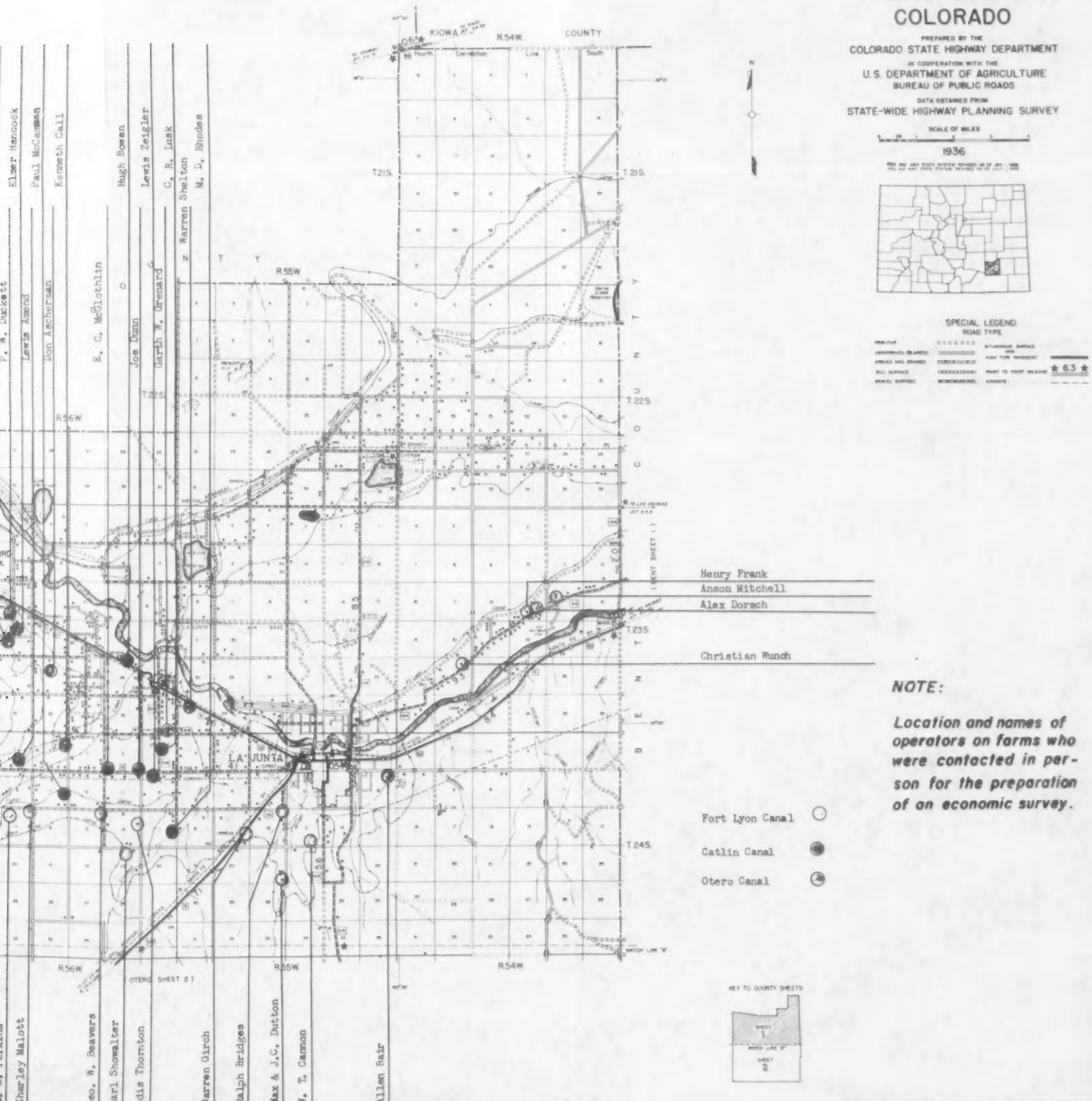

P U E B L O C O U N T Y
(PUEBLO SHEET 2)
T24S
T23S
T22S
R59W
R58W
R57W
R56W
ARKANSAS RIVER
N. Stjernholm
D. H. Fosdick
Christ Frederickson
E. R. Peats
Albert Messelhuf
L. L. Gettel
Hugh Smith
F. X. Wathen
G. Grassmick
Albert Johannes
Buel Adams
Harley Cook
C. W. McGlothlin
Clarence Baker
Wayne G. Hamilton
Elmer Watters
Fred Andrews
W. W. Caldwell
E. E. Campbell
Munroe Haines
W. Phil Blackford
Roy Lusk
Rayfield Hannagan
Geo. Maier & Son
John Martin
Frank Hansen
Jens Jeppesen
Chris Hansen
Seventh
48
Guide
Meridian
HOLLY FORD




HIGHWAY AND TRANSPORTATION MAP OF OTERO COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 5


PUEBLO COUNTY
T24S
T25S
R59W
R58W
R57W
Claude Myers
Olin Smith
David K. Smith
Murl F. Thomas
John Miller
Christian M. Spate
Vic Milinski
Arch Mallott
Herman Heathwole
P. W. Duckett
Lewis Amend
M. E. Perkins
Charley Malott
Wallace Marshall
Elmer Hancock
Paul McCamman




HIGHWAY AND TRANSPORTATION MAP OF

# OTERO COUNTY
## COLORADO

PREPARED BY THE
COLORADO STATE HIGHWAY DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DATA OBTAINED FROM
STATE-WIDE HIGHWAY PLANNING SURVEY

SCALE OF MILES

1936

SPECIAL LEGEND
ROAD TYPE

***NOTE:***

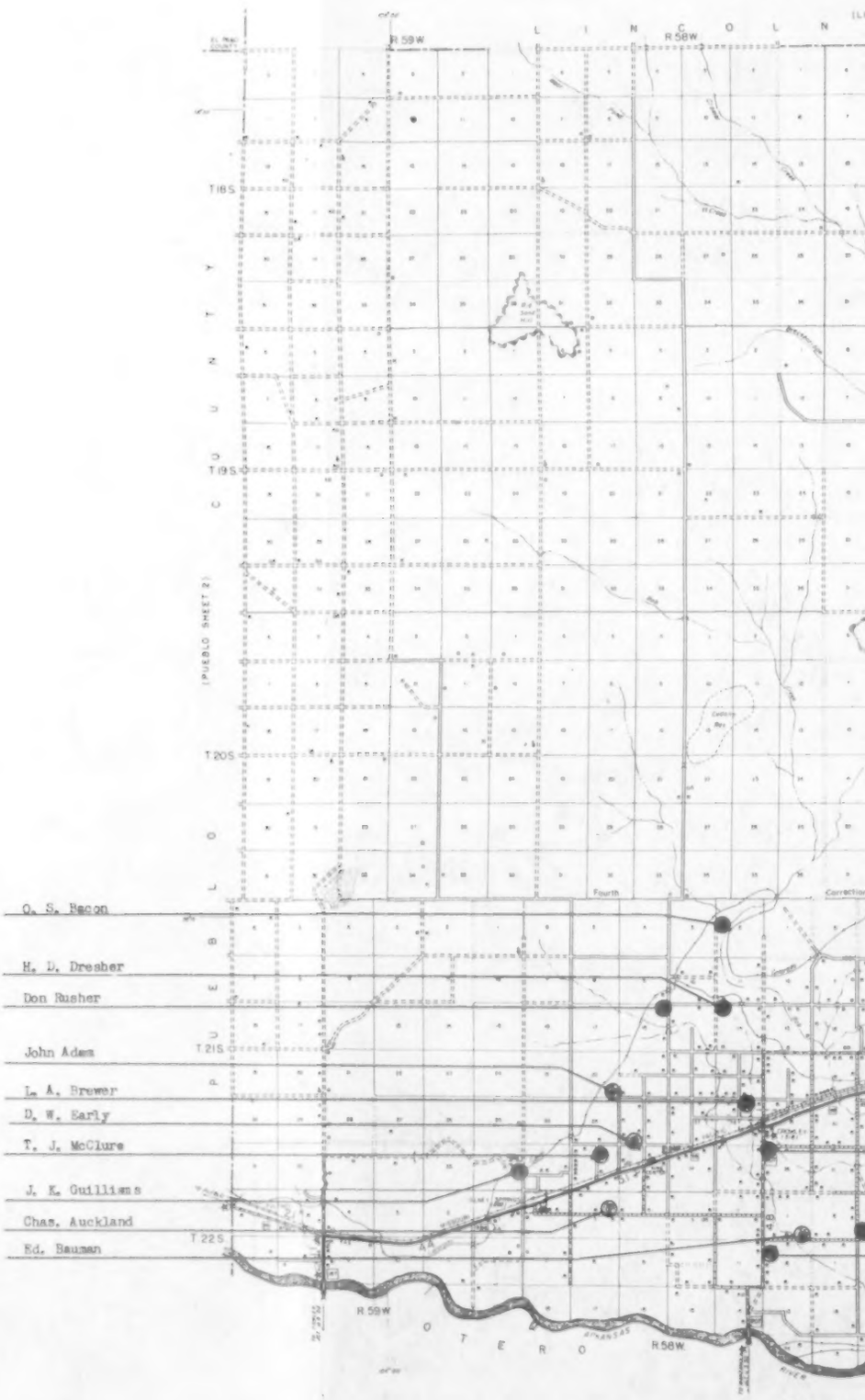
***Location and names of operators on farms who were contacted in person for the preparation of an economic survey.***

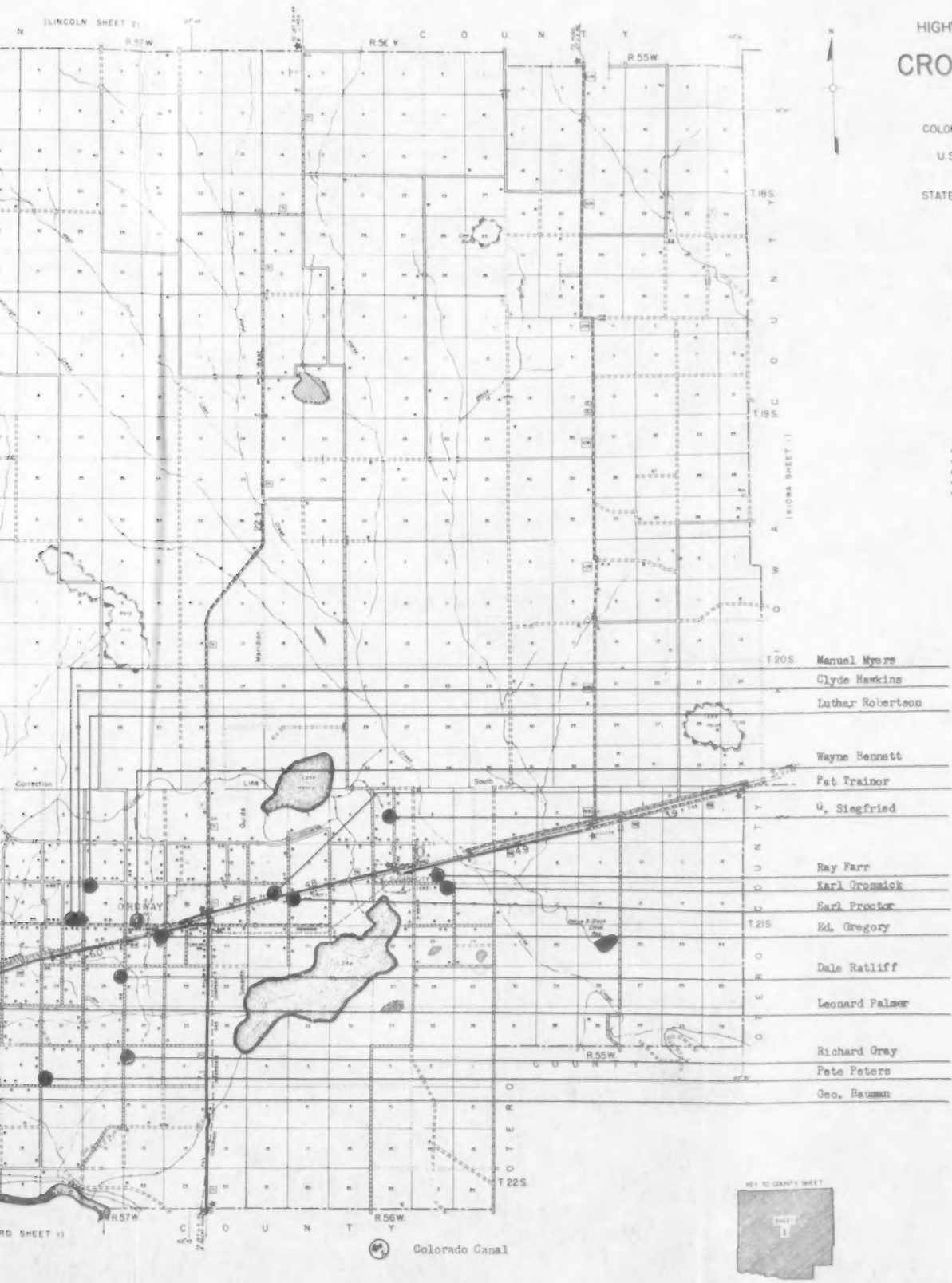
MODIFIED POLYCONIC PROJECTION

SHEET 1 OF 2 SHEETS

HIGHWAY AND TRANSPORTATION MAP OF OTERO COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 6


L I N C O L N
R.59W.
R.58W.
T.18S.
T.19S.
T.20S.
T.21S.
T.22S.
C O U N T Y
(PUEBLO SHEET 2)
O. S. Bacon
H. D. Dresher
Don Rusher
John Adam
L. A. Brewer
D. W. Early
T. J. McClure
J. K. Guilliams
Chas. Auckland
Ed. Bauman
O T E R O
(OTERO SHEE




HIGHWAY AND TRANSPORTATION
MAP OF

# CROWLEY COUNTY
## COLORADO

PREPARED BY THE
COLORADO STATE HIGHWAY DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DATA OBTAINED FROM
STATE-WIDE HIGHWAY PLANNING SURVEY

SCALE OF MILES

1936

SPECIAL LEGEND
ROAD TYPE

**NOTE:**

***Location and names of operators on farms who were contacted in person for the preparation of an economic survey.***

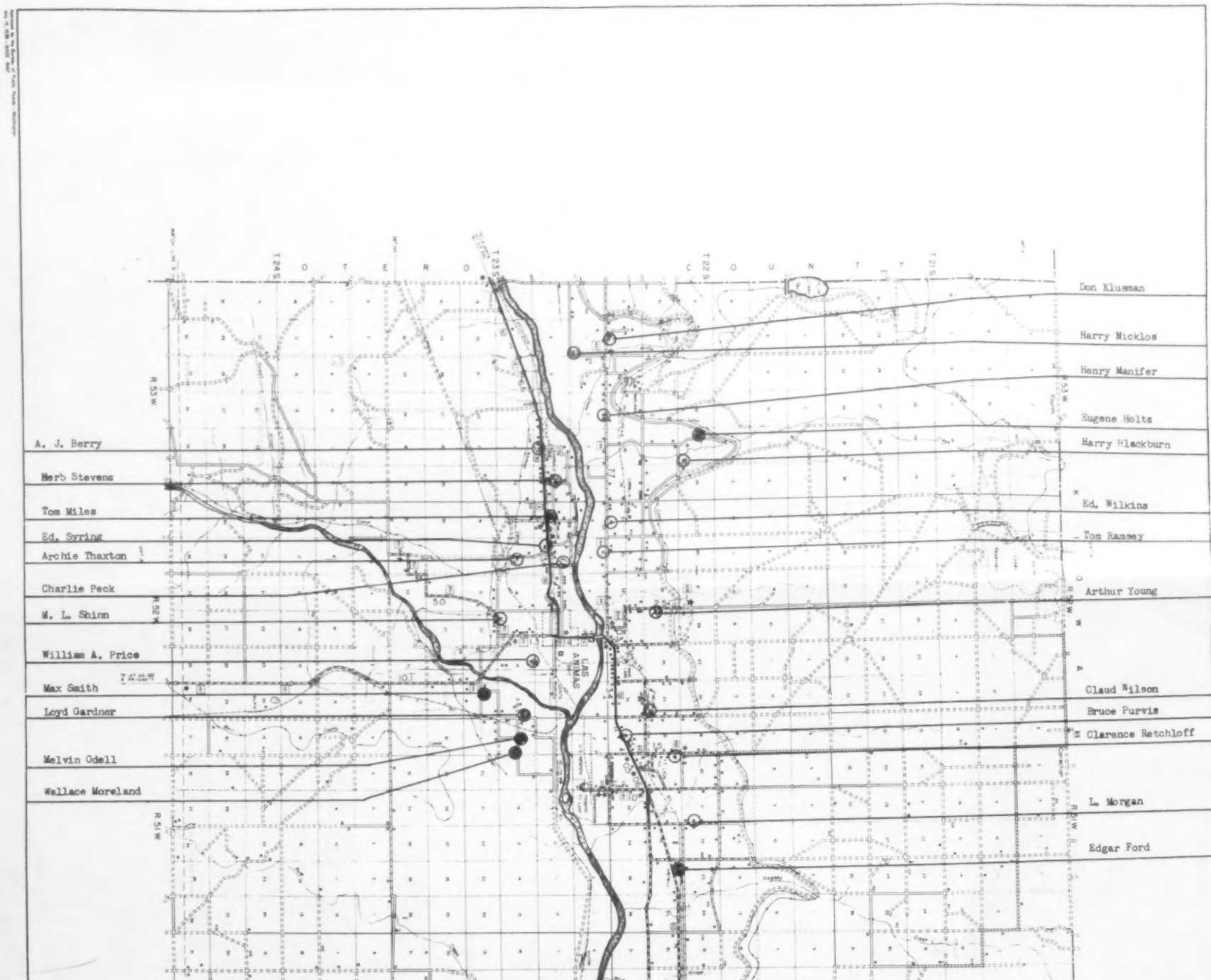
KEY TO COUNTY SHEET

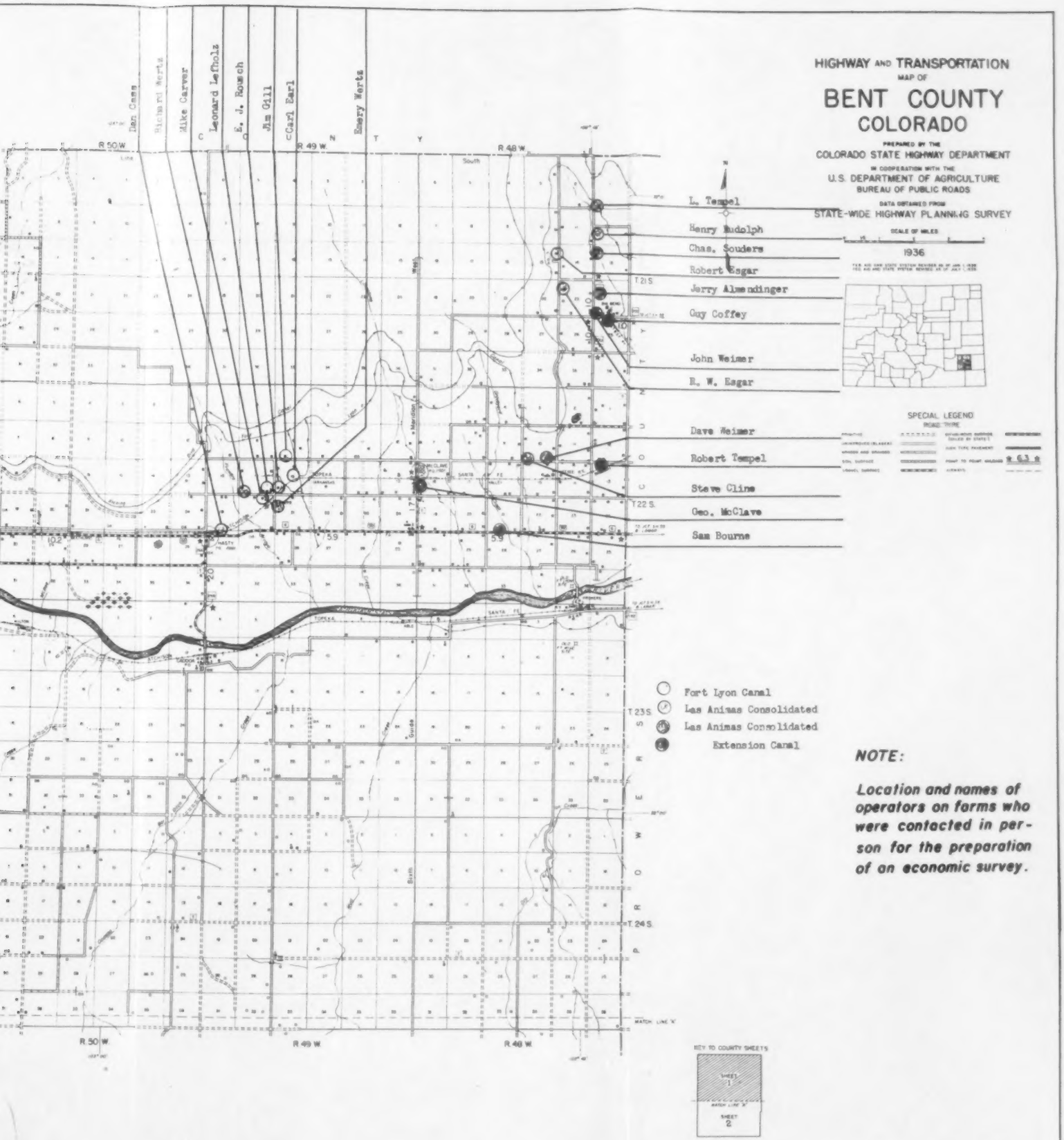
MODIFIED POLYCONIC PROJECTION

SHEET 1 OF 1 SHEETS

HIGHWAY AND TRANSPORTATION MAP OF CROWLEY COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 7


O T E R O
C O U N T Y
T24S
T25S
T22S
R53W
R52W
R51W
LAS ANIMAS
A. J. Berry
Herb Stevens
Tom Miles
Ed. Syring
Archie Thaxton
Charlie Peck
M. L. Shinn
William A. Price
Max Smith
Loyd Gardner
Melvin Odell
Wallace Moreland
Don Klusman
Harry Nicklos
Henry Manifer
Eugene Holtz
Harry Blackburn
Ed. Wilkins
Tom Ramsey
Arthur Young
Claud Wilson
Bruce Purvis
Clarence Retchloff
L. Morgan
Edgar Ford




# HIGHWAY AND TRANSPORTATION MAP OF BENT COUNTY COLORADO

PREPARED BY THE
COLORADO STATE HIGHWAY DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS

DATA OBTAINED FROM
STATE-WIDE HIGHWAY PLANNING SURVEY

SCALE OF MILES

1936

SPECIAL LEGEND
ROAD TYPE

KEY TO COUNTY SHEETS

SHEET 1

MATCH LINE 'X'

SHEET 2

**NOTE:**

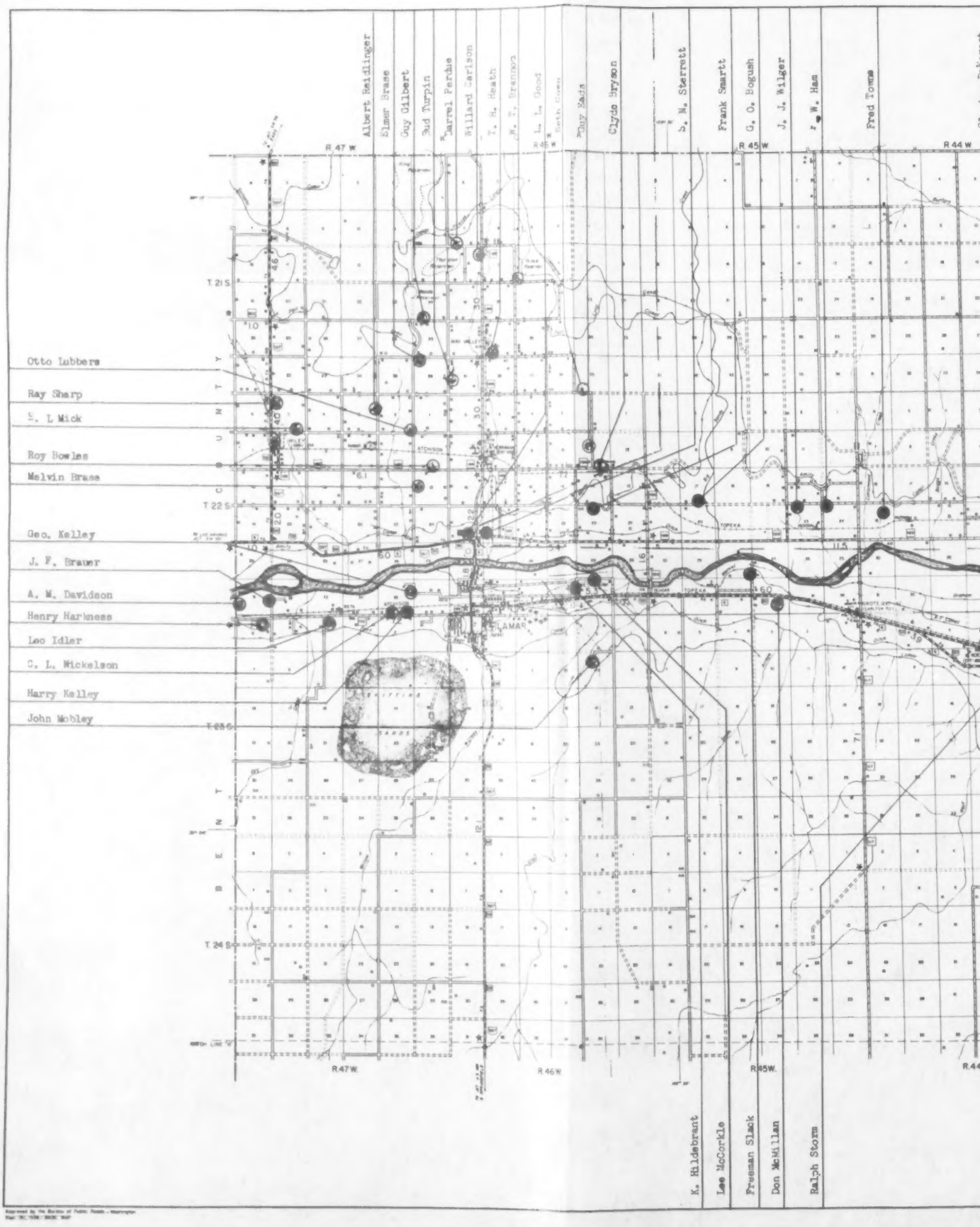
***Location and names of operators on farms who were contacted in person for the preparation of an economic survey.***

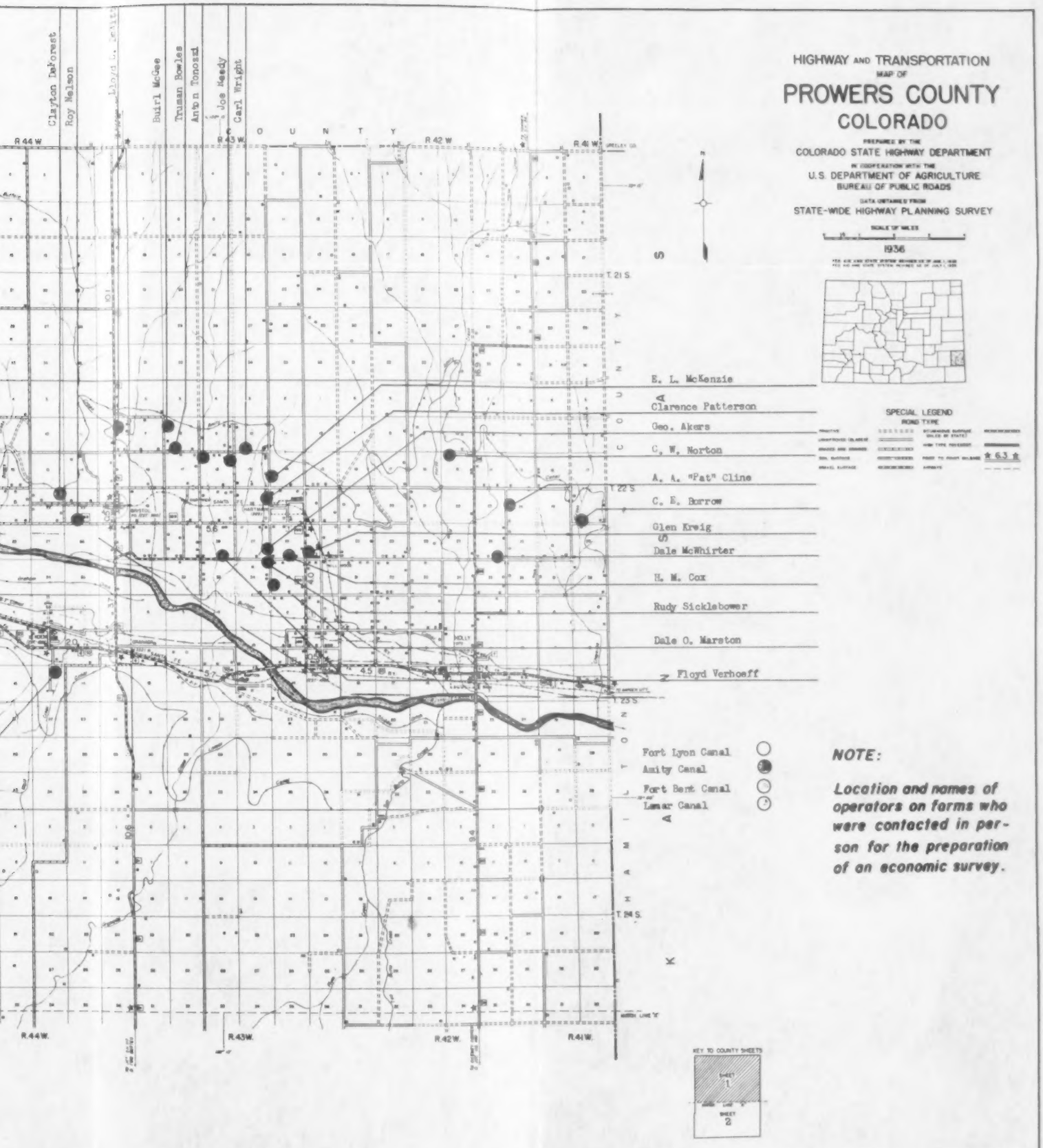
MODIFIED POLYCONIC PROJECTION

SHEET 1 OF 2 SHEETS

HIGHWAY AND TRANSPORTATION MAP OF BENT COUNTY COLORADO

49438 O - 54 (Face p. 166) No. 8


Albert Reidlinger
Elmer Brase
Guy Gilbert
Bud Turpin
Darrel Perdue
Willard Carlson
T. H. Heath
W. T. Brannon
R. L. Le Good
Seth Owen
Tony Rada
Clyde Bryson
S. N. Sterrett
Frank Smartt
G. O. Bogush
J. J. Wilger
W. W. Ham
Fred Towne
Otto Lubbers
Ray Sharp
S. L Mick
Roy Bowles
Melvin Brase
Geo. Kelley
J. F. Brauer
A. M. Davidson
Henry Harkness
Leo Idler
C. L. Nickelson
Harry Kelley
John Mobley
K. Hildebrant
Lee McCorkle
Freeman Slack
Don McMillan
Ralph Storm
R. 47 W.
R. 46 W.
R. 45 W.
R. 44 W.
T. 21 S.
T. 22 S.
T. 23 S.
T. 24 S.
LAMAR
TOPEKA
ATCHISON
WILEY
SANTA FE
RANGE
BARNS
SHEEP FEEDING




HIGHWAY AND TRANSPORTATION
MAP OF

# PROWERS COUNTY
## COLORADO

PREPARED BY THE
COLORADO STATE HIGHWAY DEPARTMENT
IN COOPERATION WITH THE
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DATA OBTAINED FROM
STATE-WIDE HIGHWAY PLANNING SURVEY

SCALE OF MILES

1936

SPECIAL LEGEND
ROAD TYPE

***NOTE:***

***Location and names of operators on farms who were contacted in person for the preparation of an economic survey.***

MODIFIED POLICONIC PROJECTION

SHEET 1 OF 2 SHEETS

HIGHWAY AND TRANSPORTATION MAP OF PROWERS COUNTY COLORADO

The varying effects of this chronic water shortage were demonstrated by the number of farmer financial failures during the drought and the depression periods. The greatest number of failures was among the farmers of those ditches with poorer water rights. The number of failures was in inverse proportion to the amount of water available for the farms. As the water shortage became more severe the number of failures increased. This was true because the cost of farming is almost as great with an insufficient water supply as with an adequate one. In addition, those farmers with an insufficient water supply were adversely affected at planting time, by either being restricted in the kind of crops they could plant or by being forced to delay planting with a resulting loss in yields. This relatively constant cost of farming combined with decreased income due to water shortages resulted in the greater number of financial failures being found among farmers of the ditches with poorer water supply.

The farmers of our valley in past years have been quite diligent in attempting to correct these conditions. A number of small reservoirs have been built and small transmountain diversions have been constructed. Wells have been put down to supplement the water supply, but these wells have been limited in number and are of assistance only to single farms. The areas where underground water is available in sufficient quantity for irrigation are quite limited. In many cases the underground water is rapidly depleted by constant pumping. While these attempts have been of value, they have not solved the problem. The shortages of water cannot be overcome without outside aid. With assistance, however, whereby the shortages can be eliminated and the income thereby increased, the farmers can repay the costs advanced by the outside assistance.

Figures furnished by the engineers show that the Fryingpan-Arkansas project would supply about 53 percent of these shortages in the average years, and would eliminate all the shortages in about half the years.

Turning to water shortages in particular instances, I want to refer to the Catlin Canal with whose problems I am familiar since it supplies my farm with irrigation water. The Catlin Canal diverts water from the main stem of the Arkansas River at its confluence with the Apishapa. It extends southeastward from there for 33 miles. There are 18,770 acres under its system of which 15,797 are irrigated. There are about 250 farms. It has the following degrees: 22 second-feet, 1,875; 226 second-feet, 1,884; 97 second-feet, 1,887.

The Catlin Canal has acquired in recent years supplement water supply. It now owns seven-eighths interest in the Mount Piscah Reservoir and the Larkspur ditch in whole.

Mount Piscah Reservoir is located on Oil or Four Mile Creek in Teller County, Colo., near the city of Cripple Creek. It has a capacity of about 3,000 acre-feet.

Larkspur Ditch is a small transbasin diversion on Marshall Pass. It produces 200 to 700 acre-feet annually, but due to difficulties of delivery has been of little use to the Catlin system. The Catlin Canal is a ditch with an above-average water right. Despite this fact, the Catlin Canal farmers experience water shortages in late March, April, and early May, and again in late July and early August.

The Catlin Canal annually diverts an average of 3.3 acre-feet of water per acre of land irrigated by its system from the Arkansas River.

Senator MILLIKIN. What crops are affected most by this water shortage?

Mr. RYAN. Those high cash income crops.

Senator MILLIKIN. Cantaloup is one of them, is it?

Mr. RYAN. Our cantaloup is affected. The onions are most severely affected. They require the most water. They have a higher requirement in the latter part of their growing season, being in the month of August. Corn is affected, and alfalfa is affected. All crops are affected, but crops that are seemingly the high-income crops are those crops which are most seriously affected.

Senator MILLIKIN. Thank you very much.

Mr. RYAN. Much of this water is diverted in late May, June, and early July. At this season of the year not all the water diverted can be beneficially used and a considerable amount is returned to the river.

This 3.3 is the gross diversion at the headgate and I am attempting in this recitation to show that we divert water during a short period there of 5 or 6 weeks more than we can use and some of that finds its way back into the main stream or the main stem of the river.

Therefore, although throughout the year 3.3 acre-feet per acre is diverted for the use of the Catlin Canal farmers, not all this water is used because it does not come at the season of the year when most needed.

A survey has been made by 23 representative farmers on the Catlin Canal to determine present losses due to water shortages and to determine how much of these losses could be eliminated by an adequate water supply.

This is the survey of which Mr. Cooper was the general chairman.

Senator MILLIKIN. Did those 23 farmers operate on their own, or were they asked to do it by organizations, or how did they come into being?

Mr. RYAN. The main committee, of which Mr. Cooper was chairman, in setting up their plans asked each ditch board to select a certain number of farmers. That number was governed by the acres supplied by that canal. They asked us to select farmers of overall average ability. They asked us to select some very good farmers, some of the poor farmers, some of the tenant farmers, and some of them were landowner farmers, to try to get a cross section of the farmer on our canal system.

Senator MILLIKIN. Thank you.

Mr. RYAN. This survey shows that the financial losses that would be eliminated by securing additional water would amount to $29.98 gross or $9.78 net per acre. Two-thirds of this saving goes to labor and for services and supplies in the community, and one-third goes to the farmer. The multiplication of this saving per acre by 15,800 would give the total saving under the Catlin Canal if adequate water supplies were available; 15,800 is the total acreage under this canal system. This saving per acre multiplied by the total acreage amounts to $473,684 gross annually or $154,524 net. This is how valuable additional irrigation water is to the farmers of the Catlin Canal.

The picture is somewhat different under another canal in my area. The Otero Canal has a less dependable water supply. As the Catlin

Canal served as an example of a ditch with above-average supply of water, so will the Otero Canal serve as an example of one with a below average supply.

The Otero was first organized as a mutual ditch company. Later, having encountered financial difficulties, they reorganized as an irrigation district and were refinanced. Under the reorganization a considerable portion of the previously irrigated land was not included in the irrigation district which as redefined contained 5,325 irrigated acres. This action, of course, improved the supply of water for the remaining acres. This group also acquired a small reservoir far upstream to give them supplemental water. Despite these efforts to solve the water shortage, the Otero Canal still has difficulties. The average annual diversion is 1.6 acre-feet per acre irrigated, as compared with 3.3 for the Catlin Canal. Therefore the requirements to give the Otero Canal farmers an adequate supply of irrigation water is greater than the average for the valley. It follows, too, that their benefits will be proportionally greater.

The farmer survey committee for this canal found that a benefit of $100.23 gross and $21.19 net per acre would result from an adequate water supply. For the whole canal system the benefits would total $533,700 gross or $112,840 net.

Senator MILLIKIN. The poorer the chances are for water under whatever ditch, the greater the benefit if they get the water.

Mr. RYAN. Exactly.

There are four other ditches in this area. The Rocky Ford Highline, the Oxford Farmers, The Rocky, and The Holbrook.

The Highline is about 80 miles long and serves 24,000 acres.

The Oxford is 13 miles long and it serves 4,500 acres.

The Rocky Ford is about 17 miles long and supplies about 5,000 acres. It is the oldest ditch in the area and has 111.7 second-feet decreed in 1874. There are only 430 second-feet decreed from the Arkansas prior to this date and therefore the Rocky Ford's supply is ample.

The Holbrook is about 43 miles long and supplies 12,201 acres.

While the shortages of irrigation water have varying effects upon the different canal systems, there is a similar general effect upon the farming conditions and methods. Because of these shortages, there is naturally, a reduced yield of the crops grown in the area. Because one of the periods of shortage comes in early spring, the result is a forced delayed planting in many seasons. Such crops as alfalfa and permanent pasture cannot be properly started. This delayed planting also adversely affects crop yields. It often happens, too, that due to prolonged spring water shortages, it becomes necessary for the farmer to completely change his planting plans.

I mean by that he will substitute crops that will stand for a later planting date.

This change often forces the farmer to substitute a lower income crop for a better one.

As the season progresses and more water becomes available, due to the warmer weather melting the mountain snows, the farmer tends to overirrigate his crops. This overirrigation is encouraged by the thought in the farmer's mind that his water supply may diminish shortly. This malpractice of over irrigating results in leaching away the fertility and also causing water logging of the heavier soils. Also

if unused, the water would benefit some junior appropriator, thereby helping to balance his supply. I am attempting to point out that if we had a constantly available water supply we would do a much better job of farming and because of the result that there would be a balanced irrigation over the growing season.

Senator MILLIKIN. I think that is an excellent point there. You cut down that overirrigating and that, in itself, would give the junior appropriators a chance to get some water.

Mr. RYAN. Yes.

While the Arkansas Valley farmers realize that these conditions and methods are undesirable and have attempted to correct them, the present water shortage prevents any satisfactory solution. However, with the additional water that can be supplied by the Fryingpan-Arkansas project, most of these undesirable conditions and methods could be corrected. And here I wish to call to your attention, the relatively small amount of water imported by this project. Also that the success of the proper reregulation of the Arkansas River by upstream reservoirs is dependent upon this imported water.

By that, I refer to the testimony that has been presented here that one is dependent upon the other.

These facts are set forth in the engineering reports. And, too, these reservoirs would allow storage of winter water, by agreement, among the farmers. This water is now applied in the winter months. Some of the applications are valuable, while in some cases the value is doubtful.

I believe Mr. Cooper went into that already and I will skip it.

Adequate water would permit a greater diversity of crops because irrigation water would be available at the proper time for the planting of any particular crop. Adequate water supplies would also mean greater yields to the farmers because water would be available during the two critical periods of early spring and midsummer.

Uniquely, too, adequate water supplies would conserve water in our area. When the farmer knows that he will have sufficient water, he will apply it to his land only when and if needed. Under present conditions the water is applied excessively at certain times in anticipation of later shortages.

In summary, I have endeavored to show the conditions prevailing in the central part of the Arkansas Valley in Colorado. The farmers there have, in the past, suffered losses because of a chronic shortage of irrigation water. While they have attempted to correct this situation, they still experience shortages. The Fryingpan-Arkansas project would do much to relieve these shortages. The savings and benefits that would result from adequate irrigation water supplied by the Fryingpan-Arkansas project would be very great and are badly needed. These savings and benefits would be widely reflected by the improvement of the general economy of the entire area.

Senator, there have been some questions asked previous to today concerning the willingness and the ability of the farmer to pay. Mr. Cooper has approached that from one angle, and I would like to approach it from just a little different angle.

Senator MILLIKIN. Go ahead.

Mr. RYAN. When early August comes, as to all the crops I grow except alfalfa, I shall have invested in that crop from $70 to $150 per acre in seeds and in labor, and other things. If I have available to me

that approximately one-half acre-foot of water to assure me that I can mature that crop properly and if they ask me to pay for it at about $5.40 an acre-foot, I certainly will be glad to indicate that I will pay for it, that I can afford to pay for it, because I regard it as a crop insurance. As I said before, I have that much money invested in those various crops and that gives me assurance that I will have that water to finish that crop.

Senator MILLIKIN. If the odds on all of the other angles of the business were equally good, you would have something pretty fat; would you not?

Mr. RYAN. It would be downhill.

As to the accuracy of the above statement with respect to these repayment plans, we have indicated that about 300 farmers made these budgets up and these are the results of a cross section of the studies of these hundred-odd farmers. They have been reviewed by committees that have been appointed to review them and to check for inaccuracies, and we feel that they are essentially correct.

I also have conversations with my farmer friends on these matters, and they indicate that they are eager to contract for water at this mentioned price.

Senator MILLIKIN. You understand that if the farmers refuse to contract for it there would not be any project?

Mr. RYAN. Yes, sir.

Senator MILLIKIN. They understand that the project will not be built until they have been solicited to sign up?

Mr. RYAN. As we understand it, we would be solicited to sign up before any construction starts.

Senator MILLIKIN. So if we are going under any misapprehensions as to whether the farmers are willing, that will be dispelled prior to the spending of money by the Federal Government; will it not?

Mr. RYAN. That is my understanding?

Senator MILLIKIN. And the farmers understand it?

Mr. RYAN. And the farmers understand it.

Senator MILLIKIN. Did you say whom you were representing specifically today?

Mr. RYAN. I am representing the Catlin Canal Co. and the Mutual Ditch Co.

Senator MILLIKIN. Have you anything further?

Mr. RYAN. I have nothing further.

Senator MILLIKIN. We appreciate your testimony very much. We will meet at 10 o'clock in the morning.

(Whereupon, at 7:15 p. m., the hearing was recessed until 10 a. m., Tuesday, June 16, 1953.)

49438—54——12

# FRYINGPAN-ARKANSAS PROJECT, COLORADO

**TUESDAY, JUNE 16, 1953**

UNITED STATES SENATE,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
*Washington, D. C.*

The subcommittee met, pursuant to recess at 10:10 a. m. in room 224, Senate Office Building, Senator Eugene D. Millikin, Colorado (chairman of the subcommittee) presiding.

Present: Senators Eugene D. Millikin, Colorado (chairman of the subcommittee); Arthur V. Watkins, Utah; Clinton P. Anderson, New Mexico; and Henry M. Jackson, Washington.

Also present: Representative J. Edgar Chenoweth, Colorado.

Also present: Kirkley S. Coulter, chief clerk; N. D. McSherry, assistant chief clerk; and Elmer K. Nelson, consulting engineer.

Senator MILLIKIN. The meeting will come to order.

Mr. Breitenstein?

## JEAN S. BREITENSTEIN, ATTORNEY AT LAW, DENVER, COLO., REPRESENTING COLORADO WATER CONSERVATION BOARD

Mr. BREITENSTEIN. My name is Jean S. Breitenstein. I am a lawyer. My office is at 718 Symes Building, Denver, Colo. I am now, and for more than 12 years have been, the attorney for the Colorado Water Conservation Board. That board is the official agency of the State of Colorado charged with the responsibility of conserving, protecting, and developing the water resources of the State of Colorado.

As the attorney for the board I represented Colorado in numerous interstate water suits in the United States Supreme Court and in the negotiation of numerous compacts.

I am the Colorado member of the Upper Colorado River Commission. That is the official agency created by the upper Colorado River Basin compact to administer that compact. In that capacity I succeeded, less than a year ago, the late Clifford H. Stone.

I am testifying here under the authorization and direction of the Colorado Water Conservation Board. That board has given the Fryingpan-Arkansas project an exhaustive study over a period of many years. By its unanimous action it has approved the project.

I would like to submit for the record, if I may, an excerpt from the minutes of the meeting of that board of February 22, 1951, indicating its unanimous approval of this project.

Senator MILLIKIN. That will be put in the record in full. Does that matter deal with the matter before this committee at this time?

Mr. BREITENSTEIN. It deals with the Fryingpan-Arkansas project, which is the same now as it was on the date of its consideration by the board, except that there has been an increase in construction costs between the two dates.

Senator MILLIKIN. Would that fact affect the judgment of the board?

Mr. BREITENSTEIN. In my opinion, it would not. The matter has been taken up with the Governor of Colorado who is the chairman of the board, and he has sent to you and to the committee, a telegram which covers that matter.

(Minutes referred to are as follows:)

MOTION ADOPTING FRYINGPAN-ARKANSAS DIVERSION (FORMERLY KNOWN AS GUNNISON-ARKANSAS PROJECT, INITIAL PHASE)

EXTRACT FROM MINUTES OF MEETING OF FEBRUARY 22, 1951, COLORADO WATER CONSERVATION BOARD

Director Stone moved that, to make the record clear, the resolutions pertaining to the Fryingpan-Arkansas project, passed by the Colorado River Water Conservation District Board and the Southwestern Water Conservation District Board, and as amended to include the words "federally financed," be included and made a part of the record of this meeting of the Colorado Water Conservation Board. The motion was seconded by John W. Beaty and, on vote being taken, the motion unanimously carried and was declared passed.

The resolutions of the Colorado River Water Conservation District Board and of the Southwestern Water Conservation District Board are as follows:

"A meeting of the board of directors of the Colorado River Water Conservation District was held at Grand Junction, Colo., on February 19, 1951, at the request of western Colorado members of the Colorado Water Conservation Board to consider and discuss the proposed Fryingpan-Arkansas diversion project, formerly referred to as the initial phase of the Gunnison-Arkansas project. All members of the board were present except Andrew Lindstrom.

"The following resolution was offered by Charles R. Neill:

"RESOLUTION

"The board of directors of the Colorado River Water Conservation District in order to be cooperative in the furtherance of the policy of the State of Colorado, hereby concurs in the complete report of the policy and review committee appointed to consider the Fryingpan-Arkansas diversion project, which report as amended has been submitted to the Colorado Water Conservation Board, subject to the condition that section IV be amended to read as follows:

" 'IV. EFFECT OF APPROVAL OF PROJECT REPORT

" 'The committee recognizes that the approval of this report is not to serve as a precedent or example for the approval of any other transmountain diversion of major proportions not heretofore authorized.

" 'The policy of the State of Colorado, as initiated in statewide meetings held under the auspices of the State planning commission at Denver and Grand Junction, and as evidenced by resolutions dated June 15, 1935, and February 28, 1936, was not adhered to because surveys of the character mentioned in the said resolutions were not available to the committee. Nothing herein contained shall be deemed or construed as a precedent for Federal projects not heretofore authorized until adequate surveys have been made and the necessary data are available so that a general allocation or apportionment of the waters of the Colorado River, allocated for consumptive use in the State of Colorado, under the *upper Colorado River Basin compact* may be made, *between eastern Colorado and western Colorado*, as distinguished from an attempt to execute such State policy by a piecemeal or series of partial allocations, any of which may seriously interfere with a complete overall State program.'

"*Be it further resolved*, That in the opinion of the board of directors of the Colorado River Water Conservation District, the Colorado Water Conservation Board should adopt a resolution that no further *federally financed* transmountain diver-

sions from the natural Colorado River Basin should be approved for authorization until the surveys described in said section IV above are completed and the need for the use of water in Western Colorado has been determined.

"Mr. Neill moved the adoption of this resolution, which motion was seconded by Mr. Danni, and the motion was unanimously carried and the resolution declared unanimously adopted.

"Grand Junction, Colo., February 19, 1951.

"Certified a true and correct copy:

"F. C. MERRIELL, *Secretary.*"

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THE SOUTHWESTERN WATER CONSERVATION DISTRICT,
"*Durango, Colo., February 14, 1951.*

"To: The Colorado Water Conservation Board.

"Re: Arkansas-Fryingpan project.

"President Dan B. Hunter presented a request that this board consider and act upon certain changes in the operating principles for the Arkansas-Fryingpan project and especially in section 15 as approved June 15, 1950.

"After due consideration, it was moved, seconded, and carried unanimously that because of the fact the matter has progressed so far, this board feels it should interpose no objection to the proposed diversion, but with the clear and distinct understanding this consent shall not be considered as waiver of objections to any other *federally financed* transmountain diversion of the waters of the Colorado River; and with the further understanding that the State water conservation board of the State of Colorado shall not approve of any other such *federally financed* diversion project until the studies of the needs of the western slope be fully completed so that an intelligent decision relative to such needs may be given. We feel that after the many and long delays in making such studies and the promises made by some high in authority in the Reclamation Service, the western slope is entitled to have such studies completed in the very near future, and that no further *federally financed* transmountain diversions should be made without the completion of such investigations.

"This consent and approval is made because this board is aware of the great and urgent need of Pueblo, Colorado Springs, and other nearby cities in the Arkansas Valley for additional water, and our desire to act the part of a good neighbor to these cities.

"Respectfully submitted.

"THE SOUTHWESTERN WATER CONSERVATION DISTRICT.
DAN B. HUNTER.
IRA E. KELLY.
ARCHIE B. TONER.
WILLIAM FINNEGAN.
D. LEWIS WILLIAMS.
WILLIAM A. WAY.
D. W. SEXTON."

The Colorado River Water Conservation District Board, as shown by its resolution which has been placed in the record of this meeting, requests the Colorado Water Conservation Board to amend article IV of the report of the policy and review committee by the insertion of certain language which is italicized for identification. It is understood that such inserted and additional language, identified by italics, will be shown in the resolution of the Colorado River Water Conservation District Board as inserted in this record.

It was moved by Judge Dan H. Hughes and seconded by C. J. McCormick that the resolution submitted by the Colorado River Water Conservation District be accepted and approved as a policy of the Colorado Water Conservation Board. On vote being taken, the motion unanimously carried and was declared adopted.

It was moved by Dan B. Hunter and seconded by John A. Cross, that the resolution submitted by the Southwestern Water Conservation District be accepted and approved as a policy of the Colorado Water Conservation Board. On vote being taken, the motion unanimously carried and was declared adopted.

Further discussion concerning the revision of the report of the policy and review committee and the operating principles of the Fryingpan-Arkansas project ensued.

It was moved by John A. Cross, and seconded by Judge Dan H. Hughes, that the report of the drafting committee to the policy and review committee (first phase, Gunnison-Arkansas project), as contained in the June 15, 1950, report to the Colorado Water Conservation Board by Clifford H. Stone, director of the

board, with the modifications of the operating principles as set out in a letter from Jean S. Breitenstein, chairman of the drafting committee, to the director of the water board, dated February 3, 1951, and with those modifications of article IV: Effect of Approval of Project Report, (p. 11 of the above-mentioned report of the drafting subcommittee of the policy and review committee), made in this board meeting of February 22, 1951, by the adoption of resolutions approved by the Colorado River Water Conservation District and the Southwestern Water Conservation District, be and is hereby formally approved.

On vote being taken, the motion unanimously carried and was declared adopted.

I hereby certify this is a true and exact copy of a minute from the minutes of the meeting of the Colorado Water Conservation Board held Febraury 22, 1951.

IVAN C. CRAWFORD, *Director.*

Signed before me this — day of May, 1953.

_____
*Notary Public.*

My commission expires April 26, 1955.

Mr. BREITENSTEIN. Also, the State of Colorado, pursuant to the provisions of the 1944 Flood Control Act, has submitted its official comments and recommendations on this project, which are favorable to the project and for the record I would like to submit a copy of those if I may.

Senator MILLIKIN. That may be put in the record in full.

(Document referred to is as follows:)

EXTRACT FROM MINUTES OF AUGUST 7, 1951, MEETING OF THE COLORADO WATER CONSERVATION BOARD

OFFICIAL COMMENTS AND RECOMMENDATIONS OF THE STATE OF COLORADO ON THE INITIAL DEVELOPMENT, GUNNISON-ARKANSAS PROJECT, ROARING FORK DIVERSION, COLORADO

(Project Planning Report No. 7–8a. 49–1, Bureau of Reclamation, Department of the Interior, dated January 1950)

AUGUST 7, 1951.

The SECRETARY OF THE INTERIOR,

SIR: On behalf of the State of Colorado and pursuant to section 1 of the act of December 17, 1944 (58 Stat. 887), there are herewith transmitted the comments, views, and recommendations of the State of Colorado concerning the initial development of the Gunnison-Arkansas project, Roaring Fork diversion, being Project Planning Report No. 7–8a. 49–1, Bureau of Reclamation, Department of the Interior, dated January 1950.

These comments, views, and recommendations are submitted under the authority of chapter 265, Session Laws of Colorado, 1937, creating the Colorado Water Conservation Board, and defining its functions in accordance with the designation of such Board by the Governor of the State of Colorado pursuant to section 1 of the act of December 17, 1944 (58 Stat. 887) as the official State agency to act in such matters.

The comments, views, and recommendations of Colorado submitted herewith are as follows:

1. Colorado recognizes that the waters of the Arkansas River in the Colorado portion of the upper Arkansas River Basin are overappropriated and that serious loss in crop production on presently irrigated farmland results. Stabilized agricultural economy in the area requires supplemental water supplies. Additional quantity and better quality of domestic and municipal water are critically needed in the Arkansas Valley, Colorado, for the cities of Colorado Springs, Pueblo, and various valley towns. New sources must be found if necessary and dependable water supplies for a growing population are to be provided. The best economy and the most efficient use of limited sources of water require multiple-use project development which will serve the needs of agriculture, requirements for domestic and municipal water supplies, flood control, the preservation of recreational and fish and wildlife values and the production of hydroelectric power. Neither further retirement of presently irrigated land to meet necessary and pressing municipal requirements for water nor project development designed to serve a single purpose would be consonant with the most desirable economic advancement of Colorado, or with the highest utilization of its limited water supplies.

2. Colorado concurs in the findings of the project report that the project described therein is engineeringly feasible, economically justified, and financially feasible, and that the proposed plan for the payment of reimbursable capital costs is in accordance with the Federal reclamation law.

3. The allocation of capital costs as between the various project features, including a nonreimbursable allocation to flood control and fish and wildlife preservation, is considered reasonable.

4. It is recognized that the allocation to the various project purposes of annual operation, maintenance, and replacement costs has been made to correspond to the allocation of capital costs. Colorado recommends that an authorization of the project shall not preclude a readjustment of operation, maintenance, and replacement charges as between municipal and domestic users and power and irrigation users which might more accurately reflect the actual use of water by said users.

5. It is also recommended that the authorization of the project include the valley pipeline as referred to in said report for the use and benefit of the various valley towns.

6. Colorado calls attention to the fact that the project, its operation, maintenance, and the use of Colorado River water thereunder, must be subject to the provisions of the Colorado River compact of November 24, 1922, (H. Doc. 605, 67th Cong., 4th sess.), the upper Colorado River Basin compact of October 11, 1948 (Public Law 37, 81st Cong., 1st sess.), and the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057–1064). Further reference to this matter appears in these comments in connection with the subject of "Operating principles." The features of the project and their operation for the storage and reregulation of the native waters of the Arkansas River are subject to the provisions of the Arkansas River compact of December 14, 1948 (Public Law 82, 81st Cong., 1st sess.), between Colorado and Kansas. On July 24, 1951, the Arkansas River Compact Administration, an agency created by the compact for its administration, after a review of the project report and consideration of the effect of the operation of the proposed project on the administration of the provisions of the compact, adopted the following resolution:

"Whereas there has been submitted to the States of Colorado and Kansas by the Secretary of the Interior, in accordance with provisions of section 1 of the 1944 Flood Control Act, a report of the Bureau of Reclamation on the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado (Project Planning Report No. 7–8a.49–1), and such States are required to transmit to the Secretary of the Interior their respective official comments and recommendations on the report and proposed development; and

"Whereas the Arkansas River Compact Administration, an official interstate body created by the Arkansas River compact and charged with the administration of such compact, is interested in the proposed development to the extent that its construction and operation shall not interfere with the rights, interests, and obligations of Colorado and Kansas under the compact: Now be it

"*Resolved by the Arkansas River Compact Administration*, That the following comments and recommendations relating to said report of the Secretary of the Interior, to wit:

"The Arkansas River Compact Administration submits these comments and recommendations to the Governors of Colorado and Kansas respecting the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, namely:

"1. The administration understands that the project plan proposes:

"(*a*) The importation by appropriate project works of approximately 70,000 acre-feet of water a year from the Colorado River Basin to the Arkansas River Basin for supplemental irrigation and domestic water supplies in Colorado and for the production of hydroelectric energy.

"(*b*) In connection with such importation of water and its regulation in the Arkansas River Valley by project works, the reregulation of native waters of the Arkansas River (the term 'native waters,' is herein used, being those waters covered and defined by article III–B of the Arkansas River compact).

"2. The interstate water relations of Colorado and Kansas with respect to the Arkansas River do not justify any objection to the proposed project development for the importation of Colorado River water (described in subparagraph (*a*) above).

"3. The reregulation of native waters of the Arkansas River (native waters being as above mentioned) concerns the Arkansas River Compact Administration and both Colorado and Kansas in complying with the provisions of the Arkansas River compact and maintaining the benefits and obligations of the two States under that compact. To that end it is recommended to the Governors of Colo-

rado and Kansas, and expressed as a policy of the Arkansas River Compact Administration, that the initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, as set forth in Project Planning Report No. 7–8a.49–1 of the Bureau of Reclamation, be approved: *Provided, however*, That there shall be no reregulation of native waters of the Arkansas River as proposed in such report until a plan of operation, rules, regulations, procedures, and agreements in the furtherance thereof, including any pertinent agreements between the Corps of Engineers and the Bureau of Reclamation, shall have been submitted to, and approved by, the Arkansas River Compact Administration and the affected water users.

"4. It is the purpose and intent of these recommendations that the proposed project development shall not interfere with or defeat the rights, interests, and obligations of Colorado and Kansas under the Arkansas River compact.

"be transmitted to the Governors of the States of Colorado and Kansas and such Governors be and are hereby requested to submit the same to the Secretary of Interior with their official State comments and recommendations upon said proposed project and development."

Colorado interprets and understands that paragraph 3 of the resolution of the Arkansas River Compact Administration is controlled by paragraph 4 thereof; and that the words "affected water users" in said paragraph 3 mean only water users in the State of Colorado so long as Colorado complies with the terms of said compact.

7. Paragraph 74, pages 27 to 33, both inclusive, under the heading "Operating principles," contains the "Operating principles" which the report explains were recommended by a policy and review committee set up by the Colorado Water Conservation Board to study and review plans and reports on the first stage of the Gunnison-Arkansas project. This committee was composed of representatives of the board, the Colorado Game and Fish Commission, western Colorado, the Arkansas Valley, and the city of Colorado Springs. The report fails to explain that such committee was required to report to the Colorado Water Conservation Board and its recommendations would not be effective until approved by that board. The report on the project does not disclose what action was taken by the board nor does it contain all of the recommendations of the policy and review committee. Some of the matters contained in the report of the committee are not strictly concerned with the project operation, but are related to, and constitute a material part of, such "Operating principles."

The recommendations of the policy and review committee were revised and approved by the Colorado Water Conservation Board on February 22, 1951. (See letter with attachments of the director of the Colorado Water Conservation Board dated February 27, 1951, and addressed to the Director of region 7, Bureau of Reclamation.) Paragraph 74, pp. 27 to 33, both inclusive, of the report correctly sets forth that part of the report of the policy and review committee, designated article II "Operating principles" as revised and approved by the Colorado Water Conservation Board, but it omits other material portions of the committee's report as revised and approved by the board, namely:

"The action of the policy and review committee will be presented to the Colorado Water Conservation Board for such action as the board deems proper.

"The action of the Colorado Water Conservation Board will be incorporated in the official comments of the State of Colorado, made pursuant to section 1 of the 1944 Flood Control Act.

"The authorization of the project will recognize the operating principles approved by the Colorado Water Conservation Board.

"Prior to commencement of project construction, the following conditions precedent must be satisfied:

"(*a*) There will be executed a payment contract between the Eastern Colorado Conservancy District and the United States in which will be incorporated the approved operating principles.

"(*b*) There will be executed such contract with the Twin Lakes Reservoir and Canal Co. as is necessary to make effective the approved operating principles.

"(*c*) The Eastern Colorado Conservancy District will firmly bind itself to the operation of the project in accordance with the approved operating principles.

"It is recommended that this project shall hereafter be referred to as the Fryingpan-Arkansas project. Approval of this provision by eastern Colorado representatives shall not be implied as an abandonment of their expressed intention to obtain approval of a project from the Gunnison River nor shall approval of this provision by western Colorado representatives be construed as any consent on their part to the authorization of a project for the exportation of water from the Gunnison River to eastern Colorado.

"The committee recognizes that the approval of this report is not to serve as a precedent or example for the approval of any other transmountain diversion of major proportions not heretofore authorized.

"The policy of the State of Colorado as initiated in statewide meetings held under the auspices of the State planning commission at Denver and Grand Junction, and as evidenced by resolutions dated June 15, 1935, and February 28, 1936, was not adhered to because surveys of the character mentioned in said resolutions were not available to the committee. Nothing herein contained shall be deemed or construed as a precedent for Federal projects not heretofore authorized until adequate surveys have been made and the necessary data are available so that a general allocation or apportionment of the waters of the Colorado River, allocated for consumptive use in the State of Colorado, under the upper Colorado River Basin compact, may be made between eastern Colorado and western Colorado, as distinguished from an attempt to execute such State policy by a piecemeal or series of partial allocations, any of which may seriously interfere with a complete, overall State program."

Paragraph 88 of the report under the heading "Recommendations," states:

"E. The project be operated under the direction of the Secretary of the Interior in accordance with the operating principles set forth in this report or as principles may be modified in the future by agreement between the Secretary and the Commission established by the State of Colorado."

It is understood that the operating principles, mentioned in this quotation from the report, are those set forth in paragraph 74, pages 27 to 33 both inclusive, and that the "Commission" mentioned therein is the Commission which may be created in the manner and for the purpose set forth in paragraph 17 of the operating principles. (See p. 33 of the report.)

Colorado's approval of the plans set out in the report and of the authorization of the project is conditioned upon compliance with the operating principles set forth in the report (see par. 74, pp. 27 to 33, both inclusive) and also full recognition and compliance with those portions of the policy and review committee's report, as revised and approved by the Colorado Water Conservation Board, which are omitted from the report and which are hereinabove set out; except that as to the name of the project, it is recommended and urged that in an appropriate manner the project should hereafter be known and referred to as the "Fryingpan-Arkansas project." It is noted from the letter of the Commissioner of Reclamation to the Secretary of the Interior, contained in the report, that it is stated:

" * * * This development is designed as a self-contained unit, and its construction would not imply a commitment for developing future water supplies in the Gunnison River Basin for diversion to the Arkansas River Basin."

Colorado approves this statement but such a statement lends weight to the reason for changing the name of the project as herein recommended. Diversion from the Fryingpan River to the Arkansas River has no relation to the Gunnison River. It is not proposed under this self-contained project to divert water to the Arkansas Basin from the Gunnison River. The identification of the project on the cover of the report and used throughout the report, "Initial Development, Gunnison-Arkansas Project, Roaring Fork Diversions, Colorado" is a misnomer and misleading, and in the future may, in some manner, lead to unwarranted implications. In addition to the recommended change in project identification, Colorado requests that the project be authorized as the "Fryingpan-Arkansas project."

8. The Colorado River Water Conservation District is an agency created by State statute (ch. 20, p. 997, Session Laws of Colorado, 1937) for the conservation, use and development of the water resources of the Colorado River and its principal tributaries. The area comprised within the District includes seven counties and a part of an eighth county within the natural drainage of the Colorado River in western Colorado. The Southwestern Water Conservation District is an agency created by State statute (ch. 231, p. 866, Session Laws of Colorado, 1941) for the conservation, use and development of the water resources of the San Juan and Dolores Rivers and their principal tributaries. The district comprises seven counties and part of an eighth county within the natural basin of the Colorado River in western Colorado. When the board of directors of each of these two districts passed upon the report and recommendations of the policy and review committee, including the operating principles, as revised, their separate resolutions, among other things, contained the following language:

*Colorado River Water Conservation District Board*

"*Be it further resolved*, That in the opinion of the board of directors of the Colorado River Water Conservation District, the Colorado Water Conservation

Board should adopt a resolution that no further federally financed transmountain diversions from the natural Colorado River Basin should be approved for authorization until the surveys described in said section IV above are completed and the need for the use of water in western Colorado has been determined." (Sec. IV, to which reference is made, is shown by the two paragraphs contained in the report of the policy and review committee, quoted on p. 5 of these comments, and commencing with the words "The committee recognizes" and "The policy of the State," respectively.)

*Southwestern Water Conservation District Board*

"* * * this board feels it should interpose no objection to the proposed diversion, but with the clear and distinct understanding this consent shall not be considered as waiver of objections to any other federally financed transmountain diversion of the waters of the Colorado River; and with the further understanding that the State Water Conservation Board of the State of Colorado shall not approve of any other such federally financed diversion project until the studies of the needs of the western slope be fully completed so that an intelligent decision relative to such needs may be given. We feel that after the many and long delays in making such studies and the promises made by some high in authority in the Reclamation Service, the western slope is entitled to have such studies completed in the very near future, and that no further federally financed transmountain diversions should be made without the completion of such investigations."

At the meeting of the Colorado Water Conservation Board on February 22, 1951, when the revised report of the policy and review committee, including revised operating principles for this project, was approved by the Colorado Water Conservation Board, the board unanimously approved two motions which provided that the resolutions, above mentioned and partially quoted, submitted by the Colorado River Water Conservation District and the Southwestern Water Conservation District be accepted and approved as a policy of the Colorado Water Conservation Board.

9. Paragraph 68 commencing on page 23 in about the middle thereof states: "The proposed basic rate of $3.60 per acre-foot at the Pueblo Reservoir has been determined to be within the payment capacity of the water users." It is respectfully requested that such proposed charge should not constitute either a maximum or a minimum charge nor should it indicate a uniform charge or indicate where water will be used or whether or not consideration in fixing charges can be given to return flows from such use. The figure is purely an estimated average charge per acre-foot and the district in allocating such water should be allowed complete latitude in connection therewith.

10. Paragraph 68 as contained on page 24 has the following sentence: "The district would assume responsibility for delivery of irrigation water." This responsibility is certainly not that of the United States, but neither should the district be responsible for patrolling every ditch. If water is turned out from the reservoir, it is immediately subject to the control of the State water officials, who should be advised of such rights in water and who are charged with the responsibility of delivering the same to the correct ditch. It is contemplated that each ditch will do its own policing.

11. Attention is directed to paragraph 68 on page 24 and the sentence reading "This district or possibly another entity would contract with the Government for Federal construction of the specific municipal water system * * *" It is contemplated that a proper repayment entity under Colorado laws such as a metropolitan-water district may be created for this particular purpose or that a joint contract executed between the various municipalities utilizing this feature will be executed and the project's authorization should be sufficiently broad to authorize any such contract deemed desirable.

12. Page 24 in the tabulation on function and source of revenue contains the following: "District tax (132 million at 1 mill minus) 10 percent, $119,000".

Attention is directed to the fact that under Colorado law, three possible rates are in existence; one-half of 1 mill, being the rate prior to delivery of project water; 1 mill, being the rate after such project water becomes available, and prior to the time of any deficiency or default; and 1½ mills in the event of default or deficiency. Levies in any of these three categories may be less but cannot exceed these figures.

13. Attention is directed to page 24, the item captioned "Municipal and industrial water, municipal supplies (38,000 acre-feet at various rates). It is respectfully pointed out that it may be some years before this amount of water is utilized and that the quantity indicated is but an estimate which may be exceeded ultimately. The authorization of the project should not preclude the possibility of

charging municipalities lower rates during the period of time that such water is not actually required for the municipal needs. Pueblo might ultimately require 10,000 acre-feet and desire at the outset to commit herself for the immediate purchase of 5,000 acre-feet. Until such time as she actually requires 10,000 acre-feet of water, she should not be charged therewith at the proposed rates. The project authorization should permit charging lower rates until the water is used for municipal purposes.

14. Attention is directed to paragraph 70 on page 25. It is respectfully suggested that the report makes no reference to potential evaporation savings by moving shallow plains storage reservoirs upstream and storing the same quantities of water at higher altitudes.

15. Attention is directed to a statement in the middle of page 38, reading:

"Such contracts should include provisions for the right of renewal thereof once or more than once under stated terms and conditions mutually agreeable to the parties and subject to increase or decrease in rates corresponding to increase or decrease of cost of construction and of operation, maintenance or improvement or deterioration in the payment ability of the water users."

This sentence must be reconciled with the existing Colorado law which is set forth in chapter 266 of the Session Laws of Colorado, 1937, being section 19 thereof, which requires the petition for allocation of water filed by the water user and addressed to the conservancy district to contain therein the charge to be imposed for each acre-foot of water. The statute requires the petition to contain the following: (1) Name of applicant, (2) quantity of water to be purchased or otherwise acquired, (3) descriptions of lands upon which the water will be used and attached, (4) price per acre-foot to be paid, (5) whether payments will be made in cash or annual installments, (6) agreement that the annual installments and the charges for maintenance and operating shall become a tax lien upon the lands for which such water is petitioned and allotted and to be bound by the provisions of this act and the rules and regulations of the Board. While it was contemplated initially that the price per acre-foot would be fixed, such as, in the case of the Colorado-Big Thompson project, $1.50 per acre-foot, it is believed that this statutory provision can be complied with by stating the price per acre-foot shall be not less than $_____ nor more than $_____.

Respectfully submitted.

DAN THORNTON,
*Governor, State of Colorado, and Ex Officio Chairman of the Colorado Water Conservation Board.*

CLIFFORD H. STONE,
*Director, Colorado Water Conservation Board.*

Without further discussion a vote was taken and the motion unanimously carried and was declared adopted.

I certify the official comments and recommendations of the State of Colorado on the initial development, Gunnison-Arkansas project Roaring Fork Diversion, Colorado, is a true and correct copy, as it appears in the minutes of the August 7, 1951, meeting of the Colorado Water Conservation Board.

IVAN C. CRAWFORD, *Director.*

Mr. BREITENSTEIN. This project which has been described, contemplates the diversion of Colorado River water for use in the Arkansas Basin in Colorado. For that reason it necessarily involves the documents which govern the use of Colorado River water. The committee well knows, of course, that the seven Colorado River Basin States in 1922 negotiated a compact governing the use of Colorado River water. That compact did not make any apportionment to the various States, but diverted the basin into an upper and a lower basin, and made an apportionment to each of those basins. The upper basin is apportioned the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum. The upper basin States in 1948 completed a compact for the division among them of this water allotted to the upper basin by the 1922 compact. Both of these compacts have been ratified by all the States involved and both of them are effective.

Colorado has the right to consume beneficially 51.75 percent of the upper basin's share of Colorado River water. The amount of water which this project contemplates to divert from the Colorado River is well within the Colorado share of Colorado River water.

Senator MILLIKIN. What part of the share is it?

Mr. BREITENSTEIN. Colorado is entitled to 51.75 percent of the upper basin share. Roughly, Senator, that is 3,855,000 plus whatever so-called salvage water there may be. For these purposes it may be taken as 3,855,000 acre-feet.

Senator MILLIKIN. This proposes to divert how much?

Mr. BREITENSTEIN. 69,200.

Senator MILLIKIN. What is the percentage?

Mr. BREITENSTEIN. I cannot give you that offhand.

Senator MILLIKIN. All right, go ahead. We will figure it out.

Mr. BREITENSTEIN. It is a very small percentage. About 2 percent, which is well within the unencumbered share of Colorado.

Senator MILLIKIN. Less than 2 percent.

Mr. BREITENSTEIN. In this connection I would like, if I may, to comment on certain matters which were presented by Mr. Raymond Matthew, the chief engineer of the Colorado River Board, of California, during the hearings on this project before the House Interior Committee.

Mr. Matthew raised, among other points, the fact that the Colorado River Board of California takes the position that the apportionment to the upper basin of the beneficial consumptive use of 7,500,000 acre-feet is a maximum in any 1 year, and not an average to be reckoned over a period years. The Colorado River Board of California also says that this quantity of water which is contemplated for diversion by this project is evidently within the entitlement of the State of Colorado under the upper basin compact.

On the matter of the apportionment being a maximum rather than an average figure, it is true——

Senator MILLIKIN. What is the relevance of that in this hearing?

Mr. BREITENSTEIN. There is no relevancy in this hearing, but I took it that this was presented for the purpose of making a record of some kind.

So far as the compact is concerned, it definitely uses the words "per annum" rather than average. Of course, if that is true, the same principle would apply to the lower basin's allotment as would apply to the upper basin's allotment. As the river is fully developed, we are very hopeful that in each basin there will be the possibility of utilizing this resource to the full extent of the apportionment.

One of the purposes of the Colorado River storage project, a bill for which has been introduced in Congress, is to assure that there will be full compliance with the Colorado River compact and the opportunity afforded the upper basin to use its full share. But in any event that is not pertinent here because the amount contemplated by thus project is well within the Colorado share.

Also Mr. Matthew, in his statement before the House committee, said that consumptive use is to be measured at places of use in the natural basin or at points of diversion in the case of transmountain export, and not in terms of depletion at some distant downstream point on the main Colorado River, such as Lee Ferry.

So far as the upper basin is concerned, as you well know, Senator, the upper basin compact provides for the measurement of beneficial consumptive use in terms of manmade depletions of the virgin flow; and the upper basin States in their compact do not recognize the principle for which California has contended that beneficial consumptive use shall be measured by diversions less returns.

Senator MILLIKIN. Assume merely for the purpose of discussion, that the California theory is correct. What has it to do with this project?

Mr. BREITENSTEIN. In my opinion, it has none because even under their own statement this is clearly within the Colorado share, whichever method of measurement might be used.

Senator WATKINS. I was not here yesterday because of other duties I had to perform. May I ask how much water from the Colorado does this project take?

Mr. BREITENSTEIN. 69,200 acre-feet, Senator.

Senator WATKINS. What do you figure the practical amount that you are going to get out of the upper Colorado compact?

Mr. BREITENSTEIN. You mean the Colorado share?

Senator WATKINS. Yes, the Colorado share. How many acre-feet?

Mr. BREITENSTEIN. Roughly, 3,800,000.

Senator WATKINS. That is, assuming that you get the full development of the River?

Mr. BREITENSTEIN. Yes, plus whatever so-called salvage water we may be entitled to. That will be a minimum in our opinion, 3,800,000.

Senator WATKINS. What do you class as salvage water? How do you define it?

Mr. BREITENSTEIN. That is water which is saved from loss by being put to use in the upper reaches of the stream. Rather than being lost naturally, it is put to use and consumed before it is lost. So it is saved. There are natural conveyance losses in any stream, and to the extent that we can save those we believe that we have the right to them. We are obligated to deliver 75 million acre-feet in every 10-year period at Lee Ferry. We are obligated to do that. As long as we do that and do not exceed our share of beneficial consumptive use, we believe we are complying with the compact.

Senator WATKINS. Does that same situation apply to the other States in the upper Colorado compact?

Mr. BREITENSTEIN. Yes, sir.

One other matter which was mentioned by Mr. Matthew relates to the quality of water. It is noteworthy that he says that it appears that the overall effect of the increased diversion proposed for the Fryingpan-Arkansas project would be small, but in this connection I wish to point out that it is our position that there is no provision of the Colorado River compact of 1922 requiring the delivery of water of any specific quality.

Senator MILLIKIN. Again, assuming for discussion's sake, only the correctness of Mr. Matthew's theory, the diversion of this mountain water would be immaterial, would it not?

Mr. BREITENSTEIN. That is his own statement as I interpret it.

Senator MILLIKIN. If a project of this size should not be authorized because of the theory suggested by Mr. Matthew then you could not have any development?

Mr. BREITENSTEIN. We would be put out of business.

Just one other matter which was covered by his statement, if I may. Mr. Matthew says that the Colorado River compact limits the use of Colorado River water to the seven Colorado River Basin States. He then points out that substantial return flows to the Arkansas may be experienced, and he says that it is the position of the Colorado River Board of California that, should the proposed project be authorized by Congress, the legislation should contain suitable language requiring the State of Colorado to give adequate assurances that any water exported from the Colorado River system to the Arkansas River Basin will be consumptively used in Colorado.

First, I assure the committee that it is the intent of Colorado to burn all this water up and so far as humanly possible to let none of it go downstream. But in that connection, I wish to point out that in our opinion there is no provision of the Colorado River compact which requires that water taken out of the Basin be entirely consumed in the State which takes it out of the Basin; that there is nothing which forbids a transmountain diversion if there are return flows which perchance flow downstream to another State.

Indeed, if the compact is construed as requiring all water taken out of the basin to be consumptively used, then I am a little apprehensive about the condition in which California may find itself. The uses in California are outside the natural basin. One of the important uses in California, a most desirable use, is in the metropolitan area. There is a substantial return flow from domestic uses, as was pointed out yesterday, and if the water has to be entirely consumed within the State then the return of this municipal water to the Pacific Ocean under the theory advanced by Mr. Matthew would, of course, be wrong. I cannot believe that they are too serious.

Senator WATKINS. Do you think they will let any of it get away?

Mr. BREITENSTEIN. I think there is some return flow to the ocean. Senator.

Senator WATKINS. There may be, but I note in a Texas project, the Canadian River, they expected to pick up from the sewers everything that was left, and use it for irrigation.

Mr. BREITENSTEIN. I doubt if that is possible for that in the Los Angeles area. I doubt if there is any irrigated land below the outfall of the sewer.

Senator WATKINS. I do not know the physical situation well enough to comment on that.

Mr. BREITENSTEIN. That was all the comment which I had to make.

Senator MILLIKIN. Assume the amount of diversion contemplated by the project and assume the type of contracts for water use which are envisioned by the project as planned, there will not be any water crossing the boundary, will there?

Mr. BREITENSTEIN. Not if it is physically possible for the State of Colorado to keep it. We want to use the water. We want to have it for use in Colorado, not in Kansas.

Senator MILLIKIN. If any escapes it would be so infinitesimal it would not be worthy of notice.

Mr. BREITENSTEIN. I agree with you.

Senator WATKINS. May I inquire about the total up to date that Colorado has diverted from the Colorado that is to be charged against her share of some 3,800,000 acre-feet?

Mr. BREITENSTEIN. Senator, there are some differences of opinion as to the exact quantities of use. I can give you my answers for them. The engineers might not agree. According to the figures that I have, the present uses in western Colorado are about a million on 19,000, and the exportations from the basin to eastern Colorado, including the Colorado-Big Thompson project, which is not yet in full operation, are 500 on 9,000. On those figures that makes a total present use from Colorado of 1,528,000.

Senator WATKINS. So you have ample to take care of this additional project?

Mr. BREITENSTEIN. Yes.

Senator WATKINS. In other words, they could not object to the other theory you would not have any water there to take over?

Mr. BREITENSTEIN. That is correct.

Senator WATKINS. Of course, I am getting into ground that you probably have covered, and I am handicapped because I was not here. That is probably not your fault. I know that the total cost of this project in comparison or in ratio to the amount of water that is involved seems very high.

Mr. BREITENSTEIN. Yes, it does. That matter was gone into by Mr. Powell yesterday, Senator. He is much more qualified on that than I am. He explained that by using the import of water together with a reregulation of native water, the project is feasible; whereas if you just took the imported water alone, or the reregulation of native water alone, there would be questions as to the feasibility of it. You see, they not only import the 69,200, but they reregulate the native water so as to capture——

Senator WATKINS. You mean on the east side?

Mr. BREITENSTEIN. On the east side, yes; so as to capture flood flows and winter flows. By using the 2 together for the generation of power, the project becomes feasible by the use of the 2 together.

Senator MILLIKIN. You take the overall project to determine the assests it has, the income and so on, and balance it against the cost?

Mr. BREITENSTEIN. Yes.

Senator MILLIKIN. On that basis you are well in the black, on the credit side?

Mr. BREITENSTEIN. Yes, sir, that was the testimony of the engineers yesterday.

Senator WATKINS. I will have to read that. I am sorry I did not hear it.

Senator MILLIKIN. It is very interesting, and you will be interested in the testimony of the two farmers who have come from that area, who state in effect that the water users will be very glad to pay the assessments which the project calls for.

Senator WATKINS. What would that mean, projecting it in the future? What would they have to pay?

Mr. BREITENSTEIN. $5.40 per acre-foot.

Senator WATKINS. That is entirely supplemental water, is it not?

Senator MILLIKIN. It is supplemental water, and it is vital water they testify for maturing their crops. If you are behind in a nine-inning ball game, you have to make it in the ninth inning or you are out. This is that ninth-inning push that helps mature their crops.

Senator WATKINS. I am well acquainted with that. We had it on the Provo River project. We found we could pay a great deal more

for the last acre-foot of water we had to use than we could for the main portion we used on our farm. It became feasible from that point of view.

If you had to take an entire farm, however, and irrigate it with this type of water, it would make it very expensive.

Senator MILLIKIN. That is true.

Mr. BREITENSTEIN. But this is supplemental water.

Senator WATKINS. You will have some help with the irrigation end of it out of power?

Mr. BREITENSTEIN. Yes, sir, out of power and out of municipal water both.

The fact that the project contemplates the use of Colorado River water on the eastern slope of Colorado brings it within the difficulty which has existed in Colorado for some years between the two slopes. Of course, that is an internal matter for Colorado, and I will pass over it briefly. I want the committee to understand that the Colorado Water Conservation Board, with a realization of the internal situation in Colorado, created what was known as the policy and review committee. That committee had on it representatives of both the eastern and western slopes. Also, because of the recreational values of the area from which the water is taken, it had representatives from the Colorado Game and Fish Department, and from the Federal Fish and Wildlife Service.

The committee consulted with representatives of the Bureau of Reclamation, leading engineers in private employment, and lawyers familiar with the Colorado problems. The committee spent more than 2½ years in studying the situation and in resolving the differences between the two areas of Colorado. They came up with certain principles which they deemed should govern the operation of this project.

A drafting committee was then appointed; I was the chairman of that committee. The operating principles were reduced to the form in which they now appear in Senate Document 106. The operating principles have been approved by the water conservation board, and for the record I wish to submit an excerpt from the minutes of the board's meeting of February 22, 1952, approving these operating principles and setting them forth at length.

Senator MILLIKIN. The reporter will include it in the record in full.

(Exerpt referred to is as follows:)

EXTRACT FROM MINUTES OF MEETING OF FEBRUARY 22, 1952, COLORADO WATER CONSERVATION BOARD

The operating principles for the first phase, Gunnison-Arkansas project (Fryingpan-Arkansas project), the recommendations for the change in the name of the project (art. III below), and the effects of the approval of the project report (art. IV below), as amended and approved by the action of the Colorado Water Conservation Board on this 22d day of February 1951, are as follows:

"The construction and operation of the project involve the diversion of water from the headwaters of the Fryingpan River and other tributaries of the Roaring Fork River to the Arkansas River Basin. The project contemplates—

"(*a*) The maximum conservation and the use of the diverted waters;

"(*b*) The protection of western Colorado water uses, both existing and potential, in accordance with the declared policy of the State of Colorado; and

"(*c*) The preservation of recreational values.

"In order to accomplish such purposes the project shall be operated by the United States in compliance with the Federal reclamation laws, the laws of the

State of Colorado relating to the appropriation, use, or distribution of water, and the following operating principles:

"1. As used herein,

"(*a*) 'Project' means that certain enterprise planned and designed by the Bureau of Reclamation, Department of the Interior, for the transmountain diversion of water from the headwaters of the Fryingpan River and other tributaries of the Roaring Fork River to the basin of the Arkansas River, together with all of its appurtenant works and facilities in both eastern and western Colorado.

"(*b*) 'Eastern Colorado' means that portion of the State of Colorado lying within the natural drainage basin of the Arkansas River.

"(*c*) 'Western Colorado" means that portion of the State of Colorado lying within the natural drainage basin of the Colorado River and served by diversions made from the Colorado River, or its tributaries, above its confluence with the Gunnison River.

"(*d*) 'Eastern Colorado Conservancy District' means that entity to be hereafter created to contract for payment to the United States of an appropriate portion of project costs allocated to certain water uses in eastern Colorado.

"(*e*) 'Aspen Reservoir' means not only the reservoir presently planned for construction near the town of Aspen as part of the project but also, unless the context requires otherwise, any other reservoir that may be constructed in western Colorado above the town of Aspen in lieu of that reservoir for the purpose of protecting water uses in western Colorado.

"(*f*) 'C. f. s.' means cubic feet of water per second of time.

"2. The Aspen Reservoir shall be constructed and maintained on the Roaring Fork River above the town of Aspen, Colo., with an active capacity of about 28,000 acre-feet and with a reasonable expectancy that it will fill annually. The 28,000 acre-feet of water stored therein shall be available for replacement purposes in western Colorado. All of such stored water shall be released under the conditions and limitations hereinafter set forth.

"3. The cost of construction and perpetual operation and maintenance of the Aspen Reservoir shall be a charge against the project and shall be paid from project revenues or as otherwise provided by the Congress of the United States.

"4. The Aspen Reservoir shall be completed before any water is diverted to eastern Colorado by means of the project.

"5. The primary purpose of Aspen Reservoir is to furnish, in like manner as if the project were constructed by a water conservancy district organized pursuant to the laws of the State of Colorado, the water required for the protection of western Colorado water users by the provisions of section 1, chapter 192, Colorado Session Laws, 1943, reading as follows: "provided, however, that any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado River and its tributaries in Colorado, by any district created under this chapter, shall be subject to the provisions of the Colorado River compact and the Boulder Canyon Project Act, as amended; that any such works or facilities shall be designed, constructed and operated in such a manner that the present appropriations of water, and in addition thereto prospective uses of water for irrigation and other beneficial consumptive-use pruposes, including consumptive uses for domestic, mining and industrial purposes, within the natural basin of the Colorado River in the State of Colorado, from which water is exported, will not be impaired nor increased in cost at the expense of the water users within the said natural basin; and that the facilities and other means for the accomplishment of said purpose shall be incorporated in, and made a part of, any project plans for the exportation of water from said natural basin in Colorado.

"6. The replacement capacity of the Aspen Reservoir is that portion of the total reservoir capacity required to protect existing rights to the use of water in western Colorado for domestic, irrigation, and manufacturing purposes (including power generation) and hereafter acquired rights to use of water in western Colorado for domestic, irrigation, and manufacturing purposes (excluding power generation) against any and all losses of needed water because of stream depletions resulting from project operations. In the determination of such replacement capacity, consideration shall be given to, but not necessarily limited to, needs for water for the following purposes, such needs, however, not to be for quantities in excess of those quantities of water which would have been available from the Roaring Fork River to supply such needs if the project had not been constructed:

"(*a*) To supply existing rights below Aspen Reservoir;

"(b) To irrigate new land and provide for supplemental irrigation in western Colorado;

"(c) To satisfy the obligation of the Roaring Fork River to contribute its proportional share of the required winter flows at a point immediately below the confluence of the Roaring Fork River and the Colorado River; and

"(d) To satisfy the obligation of the Roaring Fork River to contribute its proportional share of a demand of at least 300,000 acre-feet of water annually in the Colorado River below its confluence with the Roaring Fork River, for domestic and manufacturing uses. Said demand for use in western Colorado is to be met at the times and in the amounts required.

"Water stored in the replacement capacity of the Aspen Reservoir shall be released by the United States, upon the request of the State administrative agency having responsible charge of the distribution of the water of the stream or streams affected, whenever the needs in the Colorado River Basin in western Colorado below the project diversion points for the uses covered by this paragraph 6 exceed the available supply of water; provided that the rate of release of such stored water shall be reasonable and proper with due regard for the needs in western Colorado for replacement water and with due regard, also, for the obligation of the project to supply such water.

"No charge shall ever be imposed for water released from, or made available by reason of releases from, the replacement capacity of the Aspen Reservoir.

"7. That portion of the total capacity of the Aspen Reservoir not needed as replacement capacity constitutes surplus capacity. Water stored in such surplus capacity may be sold or leased by the United States to water users in western Colorado. Charges for the use of such water shall be comparable to charges for use of project water for similar purposes in eastern Colorado with appropriate adjustment for the replayment ability of such water users. If it hereafter appears that the cost of procuring water, from sources other than the surplus capacity of the Aspen Reservoir, for the same uses as those to which water from the surplus capacity of the reservoir is to be made available shall have been increased by reason of the construction and operation of the project, then the charges for water released from the surplus capacity shall be diminished by the amount of such increase in cost.

"8. Project diversions from Lime Creek shall be made only in the months of May and June of each year.

"9. To protect recreational values, including fishing, no diversions from western Colorado will be made which reduce the remaining aggregate stream flows to less than either of the following minimum standards:

"(a) The Fryingpan collection system at the points of diversion collectively, exclusive of Lime Creek—15 cubic feet per second, October 1 through March 31; 30 cubic feet per second, April 1 through September 30;

"(b) Near Norrie (immediately below the junction of North Fork and Fryingpan River)—30 cubic feet per second, October 1 through March 31; 100 cubic feet per second, April 1 through April 30; 150 cubic feet per second, May 1 through May 31; 200 cubic feet per second, June 1 through June 30; 100 cubic feet per second, July 1 through July 31; 75 cubic feet per second, August 1 through August 31; 65 cubic feet per second, September 1 through September 30.

"In maintaining the above minimum standards, the project diversions shall be regulated, so far as is practicable, in such a manner that the North Fork, the Fryingpan River, and each of the tributaries of those streams, shall contribute to the residual stream flows required by those minimum standards quantities of water in proportion to their natural contributions.

"10. An appropriate written contract shall be made whereby the Twin Lakes Reservoir and Canal Co. shall refrain from diverting water whenever the natural flow of the Roaring Fork River and its tributaries shall be only sufficient to maintain a flow equal to or less than that required to maintain the recommended average flows in the Roaring Fork River at the head of the proposed Aspen Reservoir in a quantity proportionate to the respective natural contributions of those streams from which diversions are made to the natural flow of the Roaring Fork River. The recommended average flows above mentioned are flows in quantities equal to those recommended as a minimum at the head of the Aspen Reservoir according to the following schedule submitted by the United States Fish and Wildlife Service and the Colorado Game and Fish Commission:

| Month | Average second-feet | Thousand acre-feet | Month | Average second-feet | Thousand acre-feet |
|---|---|---|---|---|---|
| October | 44 | 2.7 | May | 100 | 6.2 |
| November | 35 | 2.1 | June | 120 | 7.1 |
| December | 29 | 1.8 | July | 100 | 6.2 |
| January | 26 | 1.6 | August | 63 | 3.9 |
| February | 25 | 1.4 | September | 44 | 2.6 |
| March | 24 | 1.5 | | | |
| April | 64 | 3.8 | Total | | 40.9 |

"In maintaining the above averages, at no time shall the flow be reduced below 15 cubic feet per second during the months of August to April, inclusive, or below 60 cubic feet per second during the months of May to July, inclusive, providing the natural flow during said period is not less than these amounts. The obligation to supply the minimum stream flow as set forth in the above table on the Roaring Fork River shall, to the extent of 3,000 acre-feet annually, be a project obligation to be supplied from any waters diverted from the south tributaries of Hunter Creek, Lime Creek, Last Chance Creek, or any of them.

"The Twin Lakes Reservoir & Canal Co. shall not be required to refrain from diverting water under its existing decrees from the Roaring Fork River except to the extent that a like quantity of replacement water is furnished to said company without charge therefor through and by means of project diversions.

"If by reason of storage capacity in the Aspen Reservoir, the Twin Lakes Reservoir & Canal Co. derives additional water or other benefits or advantages it would not have realized had this project not been constructed, then nothing herein contained shall prevent the project from making appropriate charges for such water or other benefits or advantages.

"11. All lands acquired for project construction and operation and water surfaces of project reservoirs will be open to the public for recreational purposes, excepting those areas reserved by the operating agency.

"12. The project will be operated in such a manner that those in eastern Colorado using project water imported from the Colorado River Basin for domestic purposes shall have preference over those claiming or using water for any other purpose.

"13. The project is to be operated in such a manner as to secure the greatest benefit from the use and reuse of imported project waters within the project boundaries in the State of Colorado.

"14. Any and all benefits and rights of western Colorado water users in and to water stored in Green Mountain Reservoir, as described and defined in Senate Document 80, Seventy-fifth Congress, first session, shall not be impaired or diminished by this project.

"15. The project, its operation, maintenance, and use shall be subject to the provisions of the upper Colorado River Basin compact of October 11, 1948 (Public Law 37, 81st Cong., 1st sess.), the Colorado River compact of November 24, 1922 (House Document 605, 67th Cong., 4th sess.), and the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057–1064). In the event any curtailment of use of Colorado River water in the State of Colorado is necessary to satisfy the provisions of the Colorado River compact or the upper Colorado River Basin compact, then the diversions by the project for use in eastern Colorado shall be curtailed before there is any curtailment of the right to store water in Aspen Reservoir in a quantity not in excess of the capacity of that reservoir for use in western Colorado in accordance with these operating principles.

"16. The Secretary of the Interior shall at any time have the option to obtain or require the transfer to the United States of any and all rights initiated or acquired by the appropriation or use of water through the works of the project in eastern Colorado, except vested rights to present appropriations; provided, however, that the title so taken shall be subject to a beneficial use of such water as may be provided in the payment contract or contracts. The rights to store water in Aspen Reservoir under the applicable laws of the State of Colorado shall be initiated and acquired by and held in the name of the United States pursuant to those laws.

"17. To assure project operation in conformity with the operating principles heretofore stated, to provide a means for the collection and interchange of information, and to provide a method for the continued study of project operations to the end that, if the stated operating principles may be improved upon, recommendations for changes may be made to the contracting parties, a commission

shall be created in an appropriate manner to be composed of 1 representative of the Eastern Colorado Conservancy District, 1 representative of the Colorado River Water Conservation District, 2 representatives of the United States, and 1 representative of the State of Colorado appointed by the Colorado Water Conservation Board after consultation with the Colorado Game and Fish Commission. The powers of such commission shall be limited to the collection of data, the making of findings of fact, and the suggestion of changes in operating principles."

ARTICLE III. NAME OF PROJECT

"It is recommended that this project shall hereafter be referred to as the Fryingpan-Arkansas project. Approval of this provision by eastern Colorado representatives shall not be implied as an abandonment of their expressed intention to obtain approval of a project from the Gunnison River nor shall approval of this provision by western Colorado representatives be construed as any consent on their part to the authorization of a project for the exportation of water from the Gunnison River to eastern Colorado."

ARTICLE IV. EFFECT OF APPROVAL OF PROJECT REPORT

"The committee recognizes that the approval of this report is not to serve as a precedent or example for the approval of any other transmountain diversion of major proportions not heretofore authorized.

"The policy of the State of Colorado, as initiated in statewide meetings held under the auspices of the State planning commission at Denver and Grand Junction, and as evidenced by resolutions dated June 15, 1935, and February 28, 1936, was not adhered to because surveys of the character mentioned in said resolutions were not available to the committee. Nothing herein contained shall be deemed or construed as a precedent for Federal projects not heretofore authorized until adequate surveys have been made and the necessary data are available so that a general allocation or apportionment of the waters of the Colorado River, allocated for consumptive use in the State of Colorado, under the upper Colorado River Basin compact, may be made, between eastern Colorado and western Colorado, as distinguished from an attempt to execute such State policy by a piecemeal or series of partial allocations, any of which may seriously interfere with a complete, overall State program.

"In conformity with the foregoing, no further federally financed transmountain diversions of water from the natural Colorado River Basin shall be approved by the Colorado Water Conservation Board for authorization until the surveys hereinabove described are completed and the need for the use of water in western Colorado has been determined."

I hereby certify this is a true and exact copy of a minute from the minutes of the meeting of the Colorado Water Conservation Board held February 22, 1951.

IVAN C. CRAWFORD, *Director.*

Senator WATKINS. Do I understand the interests on the east and west slopes are in agreement; that you have accord in Colorado over these projects?

Mr. BREITENSTEIN. So far as all Colorado official agencies are concerned, Senator, there is complete accord.

Senator WATKINS. It is wonderful to get even the official agencies in accord. I congratulate you.

Senator MILLIKIN. The most important vocal objection comes from people near Aspen, Colo., who have an interest against the inundation of their lands because of the reservoir that will be built there. As I understand it the area of inundation will amount to some 600 acres, is that correct?

Mr. BREITENSTEIN. That is correct, between 600 and 700 acres, as I understand it.

I have in my statement which has been submitted here, Senator, a short discussion of these operating principles. I think it is unnecessary to go into the detail I have there. I will mention only 2 or 3 matters.

First, provision is made for the Aspen Reservoir on the Roaring Fork River above the town of Aspen, with a capacity of 28,000 acre-feet. That is for replacement purposes in western Colorado. Its cost of construction and operation is a perpetual charge against the project, and it is required that the Aspen Reservoir shall be completed before any water is diverted to eastern Colorado. That reservoir is a replacement reservoir. The operating principles set forth the manner in which the replacement shall be handled, that is, the replacement capacity, and so far as surplus capacity over and above replacement is concerned, the operating principles permit the imposition of a charge for water.

Senator MILLIKIN. Will you explain to us in a nontechnical way what is the function of that reservoir?

Mr. BREITENSTEIN. It is to permit the diversion to the eastern slope without any interference by prior water rights on the western slope. In other words, it protects the prior water rights on the western slope of Colorado, and the east slope diversions will not be curtailed because of them.

Because of the values of the area for recreational purposes, the operating principles require that certain minimum flows shall be maintained on both the Roaring Fork and the Fryingpan Rivers. In connection with those I think it should be pointed out that those minimum flows are the ones which were recommended by the Colorado Game and Fish Commission, and the Federal Fish and Wildlife Service in order to protect the fishing and recreational values of those streams.

Senator WATKINS. Does it add to the values for those purposes in any way?

Mr. BREITENSTEIN. On the Roaring Fork, Senator, I think there is a definite value which is added. The situation on the Roaring Fork is a little complex. A private enterprise, the Twin Lakes Co., has a transmountain diversion project from the headwaters of the Roaring Fork River, taking the water to the east side of the mountain. That project has decrees, and considerable decrees which will permit it to divert more water than has been diverted in the past. If it would exercise the full extent of its absolute and conditional decrees there would be an interference with recreational values and stream flows in the Aspen area.

To protect against that, the project sets up a rather complicated method of changing water with the Twin Lakes people so that their diversions will never be such as to bring these flows below the minimums set out in the operating principles. To that extent there is an increase in value in my opinion to the Roaring Fork area.

Senator WATKINS. I notice from the preliminary statement a certain amount of the cost is to be allocated to the appropriation of Fish and Wildlife, and I wondered if there is not any increase how you could justify that?

Mr. BREITENSTEIN. The nonreimbursable allocation to Fish and Wildlife was discussed by Mr. Powell yesterday, and there is, in my opinion, a very definite improvement and advantage to the fishing and recreational values in the Roaring Fork area because of the project and the proposed method of operation of the project.

Senator WATKINS. The reason I aksed you that is because I recall our discussion on the upper Colorado storage and I do not think anything was allocated for the Fish and Wildlife proposition, and nothing

for flood control and silt control or anything; just a straight allocation of all the costs to the people who were going to get the benefits.

Mr. BREITENSTEIN. That is true. That is the way that project is set up.

Senator MILLIKIN. Senator Watkins will recall that the Aspen area is a great recreational area and a great fishing area. It is nationally patronized as such.

Senator JACKSON. Next to the State of Washington, it is an excellent game and fish area.

Mr. Chairman, might I ask one question? As I understand it, 7½ million acre-feet of water is allocated to the upper Colorado Basin under the 7-State compact.

Mr. BREITENSTEIN. Yes.

Senator JACKSON. How many acre-feet to the lower Colorado Basin States?

Mr. BREITENSTEIN. Article 3 (a) of the 1922 compact apportions to each basin the exclusive beneficial consumptive use of 7,500,000 acre-feet of water. Article 3 (b) permits the lower basin to increase its beneficial consumptive use by a million acre-feet.

Senator JACKSON. They each have 7½, and they allowed the lower basin to up it?

Mr. BREITENSTEIN. There is a difference in opinion as to whether the lower basin is 8½ million or 7½ million.

Senator JACKSON. What has happened since 1921 or 1922 as to the availability of water in the basin?

Mr. BREITENSTEIN. You mean the amount?

Senator JACKSON. Has it gone up or down in the total amount of water available in the upper basin and lower basin?

Mr. BREITENSTEIN. If you are referring to quantities of water available in the stream, you are asking a lawyer an engineering question, and I understand that the more recent estimates of Lee Ferry flows have reduced the quantities from below those which were considered by the 1922 compact commission.

Senator JACKSON. The reason I ask the question is that, of course, the allocation was made on the basis of water available in 1921 or 1922, and the water table of this country has been going down quite substantially. I was just wondering whether those figures used in the compact in 1921 or 1922 are realistic as of 1953?

Mr. BREITENSTEIN. Mr. Tipton will cover that matter, Senator. All I can say on that is that it is my understanding that the Lee Ferry flows have been adequate to take care of that amount of water which is firmly committed to the upper basin and the lower basin. That is, the Lee Ferry flows plus the water available for use in the lower basin, from Gila River.

Senator MILLIKIN. Is there any variation in theory as to what the lower basin is entitled to that would affect this particular diversion?

Mr. BREITENSTEIN. No, sir.

Senator JACKSON. I want to say, Mr. Chairman, that my question was more for general information, because I understand the testimony is conclusive on the point that whatever water is diverted from the west side to the east side would not in any way affect the provisions of the compact or the upper State group.

Mr. BREITENSTEIN. The operating principles, if I may go back to them, provide that the need for additional water in the Arkansas

Basin for domestic purposes is recognized and they shall have a preference.

There is one other matter for the protection of the western slope in Colorado which should be mentioned briefly. The committee is, of course, familiar with the Colorado-Big Thompson project. At the time that project was authorized there was an agreement between the two slopes in Colorado which was set forth in what has become known as Senate Document 80. There have been some differences of opinion as to the effect and construction of Senate Document 80.

In order to make sure that nothing in connection with this project would affect or impinge upon any rights which might exist under Senate Document 80, the operating principles contain a statement making that point clear.

One other factor I think is important: The policy and review committee recognized that we cannot foresee the future and that in the course of time it may become desirable to modify some of these operating principles in order that there may be fairness and equity between the two slopes. Accordingly, the principles provide that a committee composed of representatives of the two slopes in Colorado, the State of Colorado, and the Federal Government, shall be set up to review the operation of the project under these operating principles and recommend such changes as may become desirable.

Senator MILLIKIN. Who is going to do that?

Mr. BREITENSTEIN. A Commission upon which the east slope, the west slope, the United States, and the State of Colorado are represented. The bill as submitted to the committee contains a section authorizing the appointment by the President of members to that Commission.

After these operating principles were agreed upon by the policy and review committee, they were submitted to the official west slope agencies which have been described by previous witnesses before this committee, and they unanimously approved the operating principles and the project.

Resolutions to that effect, adopted by the Colorado River Water Conservation District and the Southwestern Colorado Water Conservation District are incorporated in the minutes of the water conservation board which have been submitted to the committee for the record.

One other matter in this regard should be mentioned particularly in view of statements made at the hearings before the House committee. Recently the matter of the uses on the eastern slope of Colorado of water diverted from the western slope have arisen because of the request by Denver that it be authorized to take water from the Blue River, a tributary of the Colorado, for use in the Denver area.

That came up at the time the Colorado Water Conservation Board had before it the bill to authorize the Colorado River storage project. In order to solve that problem, the board set up the Colorado conference committee to which reference has been made heretofore.

That board is now engaged in a study of the existing and potential uses of water on the western slope of Colorado. To finance the operations of that committee, the Colorado legislature appropriated to the water conservation board the sum of $100,000.

There is nothing in that situation which at all involves the approval of this project by any of the official agencies of the State of Colorado. The matter was covered by the telegram which the Governor sent to the committee, and in order that there may be no misunderstanding as to the act of the Colorado Legislature in appropriating this money, I have here a copy of that act which I would like to submit for the record.

Senator MILLIKIN. It will be put in the record in full.

(Document referred to is as follows:)

HOUSE BILL NO. 457, BY REPRESENTATIVES MEAKER, MCLAUGHLIN, KEIRY, SMARTT, SPARKS, AND ECKHARDT

A BILL for an act relating to water development and the investigating and reporting of water resources and uses, and making an appropriation for carrying out the purposes of this act

*Be It Enacted by the General Assembly of the State of Colorado:*

SECTION 1. The Colorado Water Conservation Board is hereby authorized and directed forthwith make, or cause to be made, a study of the water resources available from surface supplies in that part of Colorado which lies west of the Continental Divide, and a study of the present and potential uses thereof to the full extent necessary to a unified and harmonious development of those waters for beneficial use in Colorado to the fullest extent possible under the law, including the law created by compacts affecting the use of said water. The studies so to be made shall include analyses of the extent to which water may be transferred from one watershed to another within the State without injury to the potential economic development of the natural watershed from which water might be diverted for the development of another watershed.

SEC. 2. The Colorado Water Conservation Board is authorized and empowered to employ such persons, and enter into such cooperative undertakings with agencies of Government as it may deem advisable for carrying out the work hereinabove outlined. The employment in this section referred to is of such persons as the Colorado Water Conservation Board finds may be necessary to meet an emergency by employing temporary personnel to supplement the work of regular State employees, it being the purpose of this law to provide for the utmost speed in accomplishing its purposes. The Colorado Water Conservation Board may grant such authority as it deems necessary or proper to the persons it may designate to carry out the provisions of this law.

SEC. 3. The Colorado Water Conservation Board shall cause the results of the study hereinabove outlined to be embodied in a written report one copy of which shall be held in the offices of said board as a public record available for the use of any interested person. Copies of said report shall be transmitted to each house of the general assembly and to the Governor, the State engineer and the State planning commission and the game and fish commission.

SEC. 4. There is hereby appropriated out of any moneys in the State treasury not otherwise appropriated, for the use of the Colorado Water Conservation Board for the performance of the work hereinabove outlined, and for no other purpose, the sum of one hundred thousand dollars ($100,000). Said appropriation shall become available to the board upon the effective date of this act, and any unused portion of said amount remaining unexpended at the end of any fiscal year shall not revert to the general fund but shall remain for the completion of said work until December 31, 1955: *Provided, however,* That whenever such work is completed said board shall so declare, whereupon any unexpended portion of said fund shall at once revert to the general fund.

SEC. 5. The general assembly hereby finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

Mr. BREITENSTEIN. The use of Arkansas River water is governed by a compact between the States of Colorado and Kansas. That compact sets up an administrative agency known as the Arkansas River Compact Administration to administer the provisions of the compact. That agency, the Arkansas River Compact Administration, at its meeting of July 24, 1951, adopted a resolution relative to

this project and approving this project, and for the record I would like to submit that.

Senator MILLIKIN. It will be included in the record in full.

(Document referred to is as follows:)

EXTRACT FROM MINUTES OF JULY 24, 1951, MEETING OF THE ARKANSAS RIVER COMPACT ADMINISTRATION

GUNNISON-ARKANSAS PROJECT, ROARING FORK DIVERSION (ARKANSAS-FRYINGPAN)

It was moved by Representative Tate and seconded by Representative Nevius that the administration approve and adopt the report of the special committee and incorporate the committee's report in a resolution submitted by the legislative and legal committee as follows:

"Whereas the Arkansas River Compact Administration, an official interstate body created by the Arkansas River compact and charged with the administration of such compact, is interested in the proposed development to the extent that its construction and operation shall not interfere with the rights, interests, and obligations of Colorado and Kansas under the compact: Now be it

*Resolved by the Arkansas River Compact Administration*, That the following comments and recommendations relating to said report of the Secretary of Interior, to wit:

"The Arkansas River Compact Administration submits these comments and recommendations to the Governors of Colorado and Kansas respecting the proposed initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, namely:

"1. The administration understands that the project plan proposes:

"(*a*) The importation by appropriate project works of approximately 70,000 acre-feet of water a year from the Colorado River Basin to the Arkansas River Basin for supplemental irrigation and domestic water supplies in Colorado and for the production of hydroelectric energy.

"(*b*) In connection with such importation of water and its regulation in the Arkansas River Valley by project works, the reregulation of native waters of the Arkansas River (the term 'native waters', as herein used, being those waters covered and defined by art. III–B of the Arkansas River compact).

"2. The interstate water relations of Colorado and Kansas with respect to the Arkansas River do not justify any objection to the proposed project development for the importation of Colorado River water (described in subpar. (*a*) above).

"3. The reregulation of native waters of the Arkansas River (native waters being as above mentioned) concerns the Arkansas River Compact Administration and both Colorado and Kansas in complying with the provisions of the Arkansas River compact and maintaining the benefits and obligations of the two States under the compact. To that end, it is recommended to the Governors of Colorado and Kansas, and expressed as a policy of the Arkansas River Compact Administration, that the initial development, Gunnison-Arkansas project, Roaring Fork diversion, Colorado, as set forth in project planning report No. 7–8a. 49–1 of the Bureau of Reclamation, be approved; *Provided, however*, That there shall be no reregulation of native waters of the Arkansas River as proposed in such report until a plan of operation, rules, regulations, procedures and agreements in furtherance thereof, including any pertinent agreements between the Corps of Engineers and the Bureau of Reclamation, shall have been submitted to, and approved by, the Arkansas River Compact Administration and the affected water users.

"4. It is the purpose and intent of these recommendations that the proposed project development shall not interfere with or defeat the rights, interests, and obligations of Colorado and Kansas under the Arkansas River compact.

"be transmitted to the Governors of the State of Colorado and Kansas and such Governors be and are hereby requested to submit the same to the Secretary of Interior with their official State comments and recommendations upon said proposed project and development."

On vote being taken, the motion carried and was declared adopted.

The above extract was taken from the set of minutes of the Arkansas River Administration, filed in the office of the Colorado Water Conservation Board.

IVAN C. CRAWFORD, *Director*.

Mr. BREITENSTEIN. There is only one other matter that I think can be covered by me, and that is that the project contemplates the organizations on the east slope of a conservancy district under the Colorado Water Conservancy District Act. That district will make a firm contract with the United States for the repayment of the re imbursement costs charged to agriculture and perhaps to some extent to those charged to municipalities. The committee, I am sure, is familiar with districts under that act because they take care of the reimbursable costs of the Colorado-Big Thompson project, the Conejos division of the San Luis Valley project, the Paonia and Mancos projects, and others in Colorado.

Senator MILLIKIN. That will be reimbursed by the entire district whether or not particular parts of the district directly benefit from the project.

Mr. BREITENSTEIN. As was described yesterday, the law permits the imposition of a mill levy not to exceed one and a half mills for indirect benefit.

Senator WATKINS. Does this area which will be included in the conservancy district take in practically all the cities and towns and the counties and municipal corporations of various types within the area?

Mr. BREITENSTEIN. The boundaries of the district have not yet been set up, but it is the intent to include not only the agriculture area, but the municipal area.

Senator WATKINS. Does this organization have to be set up prior to the beginning of construction?

Mr. BREITENSTEIN. The organization will have to be set up and contract made with the United States or it is no go.

Senator WATKINS. There have been cases where that has not been true.

Mr. BREITENSTEIN. I know, but this contemplates the creation of the district and the entry into the contract.

Senator JACKSON. In the House appropriation bills we have been writing the condition that before the money is made available to the districts a repayment contract be entered into by the water district or whatever it may be, municipal corporation of the State, prior to actual disbursement of funds to commence work on the project, which I think, Mr. Chairman, is proper and the way it should be.

Senator WATKINS. That has been the rule in Utah. In all of our Utah contracts we have had a contract actually signed and approved before any money has been spent or any contracts let. I do remember projects that have been before us, one that was actually authorized, that did not require that sort of thing.

Mr. BREITENSTEIN. Yes.

Senator MILLIKIN. Is there anyone in the Colorado delegation prepared to say what the assessed value is of the property within that district?

Mr. DUCY. I can answer that, Senator. Our assessed value is $345 million in the 12 counties using the 1952 assessment rolls.

Mr. BREITENSTEIN. The Colorado Water Conservation Board has approved this project, and it most respectfully requests favorable action by the committee.

(Statement of Jean S. Breitenstein is as follows:)

A STATEMENT BY JEAN S. BREITENSTEIN SUPPORTING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT

My name is Jean S. Breitenstein. I am a lawyer with offices at 718 Symes Building, Denver, Colo. I am now and for more than 12 years have been the attorney for the Colorado Water Conservation Board. As such attorney I have represented Colorado in numerous interstate water cases before the United States Supreme Court and in the negotiation of interstate water compacts. The Colorado Water Conservation Board is the official agency of the State of Colorado, charged with the responsibility of conserving, protecting, and developing the water resources of the State of Colorado.

I am the Colorado member of the Upper Colorado River Commission which is the official agency set up by the upper Colorado River Basin compact for the administration of that compact. In this capacity I succeeded, less than a year ago, the late Judge Clifford H. Stone.

The Fryingpan-Arkansas project is a desirable development which has long been needed in Colorado. Over the years the Colorado Water Conservation Board has made an exhaustive study of this project. The board, by its unanimous action, has approved the project. For the record, I present a copy of its action in that regard.

The favorable comments of the State of Colorado signed by its Governor and the director of the Colorado Water Conservation Board have been included within Senate Document 106, 82d Congress. For the record I submit a copy of those comments at this time.

COLORADO RIVER WATER

The scope of this project either has been or will be given to the committee by other witnesses. Its various features should properly be described by a trained engineer. Suffice it to say that the project contemplates a diversion of approximately 70,000 acre-feet of water a year from the Fryingpan River and Hunter Creek. This water is taken through the Continental Divide by a tunnel and emptied into the headwaters of the Arkansas River. Thus, we have a transmountain diversion project where water is taken from tributaries of the Colorado River and thereafter utilized in the basin of a stream which flows into the Mississippi River. This factor requires that some comment should be made on the various documents which control the use of the waters of the Colorado River.

As the committee well knows, the seven Colorado River Basin States in 1922 negotiated a compact setting forth basic principles to control the use of Colorado River water. By this compact, which was proclaimed effective by the President of the United States on June 25, 1929, and which has now been ratified by all Colorado River Basin States, an apportionment of water is made to the lower basin and to the upper basin. The dividing point between the two basins is Lee Ferry which is located in Arizona a short distance below the Utah boundary line. The compact apportions to the upper basin the beneficial consumptive use of 7,500,000 acre-feet of water per annum and makes no division of this quantity of water among the States within which the upper basin lies.

In 1948 the upper basin States completed a compact for the division among them of this 7,500,000 acre-feet of water per annum. That compact was ratified by the States and is now effective. Under its terms Colorado has the right to consume beneficially 51.75 percent of the upper basin's share of Colorado River water. The administration of the upper Colorado River Basin compact is, as I have said, under the Upper Colorado River Commission of which I am a member.

The comparatively small quantity of water which is proposed to be taken from the Colorado River system for use in the Arkansas River Basin is well within the Colorado share of Colorado River water. The availability of such 70,000 acre-feet of water, so far as I know, has not been questioned.

OPERATING PRINCIPLES

The matter of the use in Colorado on the eastern slope of water taken from the Colorado River system has long presented a difficult intrastate problem. With a realization of this situation those interested in the Fryingpan-Arkansas project, early in the investigation and study of that project, presented the matter to the Colorado Water Conservation Board as the official State agency having charge of such matters. That board created what was known as a policy and review committee on which there were representatives of the two slopes and, because of the interest in recreational values, there were members on the committee from the Colorado Game and Fish Department and the Federal Fish and Wildlife Service.

This committee consulted with representatives of the Bureau of Reclamation, leading engineers in private employment, lawyers familiar with the problems, and water users on both sides of the Continental Divide. After more than 2½ years of effort, the policy and review committee unanimously agreed upon a set of operating principles which, in its opinion, will fairly and equitably protect the rights of those interested in the development of the western slope and at the same time permit the diversion of the water to the Arkansas Basin where it is badly needed for domestic and agricultural uses.

A copy of these operating principles are set forth in Senate Document 106, 82d Congress, 2d session, pages 19–23. The recommendations of the regional director of the Bureau of Reclamation approved by the Commissioner of Reclamation and the Secretary of the Interior are that the project shall be operated in accordance with these operating principles. Unavoidably these principles are rather complex. Perchance, for the record, it may be well to summarize the more important provisions.

The operating principles recognize that the project contemplates the maximum conservation and use of the diverted waters, the protection of both existing and potential western slope water uses in accordance with the declared policy of Colorado, and the preservation of recreational values.

Section 1 contains the definition of terms.

Section 2 provides for the construction of the Aspen Reservoir on the Roaring Fork River above Aspen, Colo., with a capacity of 28,000 acre-feet which shall be available for replacement purposes in western Colorado.

By section 3 the cost of construction and perpetual operation and maintenance of the Aspen Reservoir is a charge against the project.

Section 4 requires that the Aspen Reservoir shall be completed before any water is diverted to eastern Colorado.

Section 5 states that the primary purpose of Aspen Reservoir is to furnish compensatory storage in like manner as if the project were constructed by a water conservancy district organized under the Colorado Water Conservancy Act. In this connection it should be mentioned that such act (Colo. S. L. 1943, ch. 192) provides in substance that any facilities designed for the exportation of water from the natural basin of the Colorado River by a district organized under the act shall be so constructed and operated that present appropriations of water and prospective uses of water for consumptive use purposes in the natural basin will not be impaired or increased in cost because of the diversion

Section 6 defines the replacement capacity of the Aspen Reservoir and provides the purposes for which such replacement capacity may be used. No charge is imposed for water released from the replacement capacity.

Section 7 defines surplus capacity, provides for the release of water therefrom, and permits the imposition of a charge for water released from the surplus capacity.

Section 8 limits project diversions from Lime Creek to the months of May and June because of anticipated demands upon Lime Creek.

Section 9 is designed to protect recreational values, including fishing, and requires the maintenance of certain minimum flows at designated points on the Fryingpan River.

Section 10 pertains to diversions from, and the maintenance of stated minimum flows on, the Roaring Fork River. This section is important and is required because a private enterprise, the Twin Lakes Reservoir and Canal Co., holds Colorado decrees for the diversion through its facilities of substantial quantities of water from the headwaters of the Roaring Fork River. The Twin Lakes Co. has thus far been unable to utilize their rights to the fullest extent because of insufficient storage capacity on the eastern side of the mountains. In the event of an increase in that storage capacity, the Twin Lakes Co. could divert from the headwaters of the Roaring Fork such quantities of water that the recreational values of the Roaring Fork area might be affected. The Fryingpan-Arkansas project is so set up that it can by exchange furnish to the Twin Lakes Co. water from other sources than the Roaring Fork and, hence, it will be possible to maintain minimum flows as recommended by the United States Fish and Wildlife Service and the Colorado Game and Fish Commission. This is a desirable protection to the Aspen area which is nationally recognized for its recreational values.

Section 11 is a further protection to those interested in recreation. It provides that lands acquired for project construction and operation and water surfaces of project reservoirs will be open to the public for recreational purposes, except in instances where the area is necessarily reserved by the operating agency.

Section 12 recognizes the need of additional water in the Arkansas River Basin for domestic purposes and requires that the project be operated in such a manner

that those in eastern Colorado using project water imported from the Colorado River Basin for domestic purposes shall have preference over those claiming or using the water for other purposes.

Section 13 states that the project will be operated in such a manner so as to secure the greatest benefit from the use and reuse of imported project water.

Section 14 is very important. The committee is no doubt familiar with the Colorado-Big Thompson project. In the authorization of that project it was required that the project should be constructed and operated in conformity with an agreement between west slope and east slope interests. That agreement is set forth in Senate Document 80, 75th Congress, 1st session. Provision is there made for the construction of Green Mountain Reservoir to furnish replacement or compensatory storage for existing and potential west slope uses. Some differences of opinion have arisen in regard to Senate Document 80. In order to assure the west slope people that there is no intent to impinge upon whatever rights they have under Senate Document 80, section 14, provides that such rights shall not be impaired or diminished by the Fryingpan-Arkansas project.

Recognition of those documents which now constitute the law of the Colorado River is given by section 15 which provides that the operation and use of the project shall be subject to the 1922 Colorado River compact, the 1948 upper Colorado River Basin compact, and the Boulder Canyon Project Act. To protect further the west slope uses it is provided that in the event of necessity to curtail any project uses in order to secure compliance with the aforementioned documents, then before there is any curtailment of the right to store in Aspen Reservoir the diversions for use in eastern Colorado must be curtailed in a quantity not in excess of the capacity of that reservoir.

In section 16 the Secretary of the Interior is given the option to require the transfer to the United States of rights initiated or acquired for the project in eastern Colorado except, of course, the present vested rights of Colorado waters users. Rights to store water in the Aspen Reservoir shall be acquired under the applicable Colorado law as is required by the existing Federal reclamation laws and shall be held in the name of the United States.

The concluding section, section 17, is somewhat of an innovation. The policy and review committee recognized the extreme difficulty in setting up a formula which can be fair and equitable under future conditions which cannot be foreseen. Accordingly, provision is made for a commission upon which the east slope, the west slope, the United States, and the State of Colorado are represented. This commission is empowered to study the operation of the project with particular regard to the agreed operating principles and to make such recommendations for changes as it believes may more nearly bring about the attainment of the ends sought by the operating principles.

### WESTERN SLOPE APPROVAL

After the operating principles were agreed upon, they were submitted to the official agencies representing the western slope. The Colorado River Water Conservation District is an official, quasi-municipal agency representing the western Colorado area within which the main stem of the Colorado River is located, with the exception of Grand County. Pitkin County, within which Aspen is located and within which diversions will be made for uses on the eastern slope, is within the Colorado River Water Conservation District. The board of directors of that district considered this project and the operating principles which I have discussed and by its unanimous vote, including the vote of the director from Pitkin County, approved the project. For the record I hand you a copy of the action of that district's board of directors.

One other area in Colorado which is concerned is the Southwestern Water Conservation District which is an official quasi-municipal agency representing the area immediately south of that included within the area represented by the Colorado River Water Conservation District. The board of directors of the Southwestern Water Conservation District also considered this project and the operating principles and its board of directors unanimously gave its approval to the project. For the record I submit a copy of the resolution adopted by that district's board of directors.

### REPAYMENT ENTITY

The plan for the Fryingpan-Arkansas project contemplates the organization of a water conservancy district which will contract with the Government for the repayment to it of those reimbursable costs allocated to irrigation and perhaps, to

some extent, to domestic and industrial uses. This committee and the Congress are familiar with the districts organized under the Colorado Water Conservancy Act. Some 6 or 7 water conservancy districts have been organized in Colorado. In connection with the Colorado-Big Thompson project, the Conejos unit of the San Luis Valley project, the Paonia and the Mancos projects, a water conservancy district is the entity which is responsible for the payment to the United States of reimbursable costs. It would seem that under the circumstances a specific description of the powers, duties, and liabilities of such a district are unnecessary.

ARKANSAS RIVER COMPACT

One other phase of this matter should be mentioned. In 1948 the States of Colorado and Kansas signed a compact relating to the use of Arkansas River water in those States. That compact was later ratified by the State legislatures and is now effective. Article IV D of that compact provides as follows:

"D. This compact is not intended to impede or prevent future beneficial development of the Arkansas River Basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoirs, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: *Provided*, That the waters of the Arkansas River, as defined in article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this compact by such future development or construction."

It would seem clear that the proposed project is well within the requirements of the above-quoted section of the Arkansas River Compact. Indeed, there seems little doubt that downstream water users will welcome Colorado River water into the Arkansas River Basin.

AUTHORIZATION LEGISLATION

There are 1 or 2 provisions of the bill now before you which should be mentioned. Section 2 authorizes the Secretary of the Interior to appoint two representatives of the United States to the commission which is required by the operating principles. This is necessary because there is no existing Federal law under which such representatives may be appointed. The creation of the commission is very wise. The bill should contain the necessary provisions to implement the operating principles.

Your attention is also directed to the fact that section 3 of the bill repeats the protection for western Colorado contained in the operating principles so far as the rights of western Colorado under Senate Document 80 are concerned.

One other provision of the operating principles is also recognized in the bill. You will recall that the operating principles require a preference for the use of water for domestic purposes. In order to eliminate any possible inconsistency with Federal reclamation laws the bill provides for the preference for domestic use.

I submit to the committee that the Fryingpan-Arkansas project is a desirable project which has long been needed. It will utilize water which is well within Colorado's share of Colorado River Basin water. Most careful study and consideration have been given to the protection of the basin within which the water arises and from which it will be diverted. After many years of study all of the official Colorado agencies charged with the responsible action on matters such as this have given their approval to the project.

Senator MILLIKIN. Thank you very much, Mr. Breitenstein. Are there any questions?

Senator WATKINS. I want to ask a question which probably should have been asked of the engineers, but I missed them.

Mr. BREITENSTEIN. You will have a good engineer after me.

Senator WATKINS. You can probably tell us.

Under the Colorado-Kansas compact on the Arkansas River, does it allow for the development and putting to use of floodwaters so that you will have a water supply?

Mr. BREITENSTEIN. Yes; there is a particular provision of the compact which covers that.

Senator WATKINS. I presume water studies have been made over the years so that they know they have water to put in the reservoir?

Mr. BREITENSTEIN. I think there is no stream in Colorado where the records have been kept more carefully than on the Arkansas. That stream is one where there have been very careful records kept over a long period of time.

Senator WATKINS. It seems rather foolish to ask at that stage of reclamation development whether or not there is sufficient water to take care of a project and to cover the development, but I have in mind one of my first experiences here in the Senate was to drill some wells to help find some water to put in a reservoir that had been built in another State that did not have any water. They built a big reservoir that cost millions of dollars and did not have any water.

I feel that I should ask that question of everybody. What about the water supply?

Mr. BREITENSTEIN. Mr. Tipton, who is our outstanding expert in Colorado on these matters, will follow me on the stand. He can testify with certainty, whereas I am just a lawyer and can only testify by heresay.

Senator JACKSON. Would the agreement between the conservation district which is to be set up and the Bureau constitute a general obligation? That is, an agreement to repay against the whole district?

Mr. BREITENSTEIN. It is a general obligation, yes; and proceeds from the mill levy can be utilized to pay it off.

Senator JACKSON. In other words, if the water users go in default the conservation district could levy against the property in the conservation district?

Mr. BREITENSTEIN. Yes. The assessment is just like a general tax, and you have the same recourses as you have for failure to make tax payment.

Senator JACKSON. By foreclosure?

Mr. BREITENSTEIN. By tax sale.

Senator WATKINS. I would assume also probably the Bureau of Reclamation, if it is as tough as it used to be, would write in a provision to get a writ or mandate to compel you to levy the tax.

Mr. BREITENSTEIN. That is right. I assume that would be there.

Senator WATKINS. In other words, if your directors did not want to levy the tax——

Mr. BREITENSTEIN. They could be mandamused to do it.

Senator WATKINS. They could be compelled to do it?

Mr. BREITENSTEIN. That is right.

Senator MILLIKIN. Thank you very much, Mr. Breitenstein.

Mr. Tipton? We are glad to see you, Mr. Tipton.

## STATEMENT OF ROYCE J. TIPTON, CONSULTING ENGINEER, DENVER, COLO., SUPPORTING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT

Mr. TIPTON. Mr. Chairman and members of the committee, my name is Royce J. Tipton. I am a consulting engineer in Denver, Colo. In addition to operating as an independent consulting engineer, I am a principal in, and at the moment president of, three engineering corporations which are engaged in water development work in the

United States, the Republics of Colombia, Venezuela, and the Commonwealth of Pakistan.

I have been identified as an engineer in varying capacities with the water development of the State of Colorado and the problems incident thereto since 1924. I have been consulting engineer for the Colorado Water Conservation Board continuously since its creation in 1937.

Mr. Chairman, I have a written statement which I am afraid contains some duplications of testimony given by other witnesses. I am not going to read this. I rather suspect that it should not be offered for the record except some portions of it which I will indicate.

Senator MILLIKIN. Take your own head.

Mr. TIPTON. For more than 50 years continuous and vigorous efforts have been made by the water users of the Arkansas River Basin to construct works to provide needed supplemental water supplies. For half of that period I personally have been identified with the major efforts made in that connection.

The Arkansas River Basin developed very rapidly beginning in the 1850's. By the early 1890's all of the basic water supplies of the river and its tributaries had been appropriated. A great need developed for supplemental water supplies. The most obvious means for providing those supplies at that time was the construction of reservoirs.

Reservoir construction started and continued at a fairly rapid pace for some two decades until all of the feasible reservoir sites that could be constructed by private initiative were constructed. By 1910 some 38 reservoirs had been completed with an aggregate capacity of 643,000 acre-feet. No other possibilities existed that were within the ability of private or even combined interests to go forward.

Senator WATKINS. Notwithstanding that development which was rather extensive, was there still floodwater going to waste?

Mr. TIPTON. Yes. I will touch on that in a moment, Senator Watkins.

The next best source for supplemental water supplies appeared to be the bringing of water from the west slope to the east slope. Again by private initiative, investigations were made and some development was undertaken. Six small transmountain diversions had been constructed by 1935, which have diverted an average of about 7,000 acre-feet per year, and which have a potential of about 13,000 acre-feet per year.

Meanwhile, private interests had elicited State aid. The State engineer made exhaustive investigations of transmountain diversion possibilities. One investigation crystallized preliminary plans for the Taylor Park diversion. Much support developed in the valley for the construction of that project. In my opinion it would have been constructed had it not been for the authorization of Taylor Park Reservoir for the benefit of the Uncompahgre reclamation project on the western slope which made the Taylor Park transmountain diversion unfeasible. It would have had a diversion potential of 120,000 acre-feet.

In the meantime the so-called 308 reports of the Corps of Engineers were proceeding, and there was authorized and constructed as a result of one ot those reports the Caddoa Reservoir, a multiple project which is in operation.

The John Martin Dam which creates the reservoir is located above the city of La Junta on the main stem of the river. The head of the reservoir is just below the city of Las Animas. The reservoir has a total capacity of 655,000 acre-feet, of which about 400,000 is for regulatory purposes, the balance being for flood-control purposes.

That project was the first one to be built in the valley with Federal money. The project added considerable storage capacity to that already existing——.

Senator JACKSON. What year was that?

Mr. TIPTON. The project was completed and went into operation in 1943.

Senator WATKINS. Was that an Army engineer project?

Mr. TIPTON. Yes, sir. But even after its construction and even after the construction of another project which I will describe, there still remained large shortages of water.

The Reconstruction Finance Corporation was created in 1932 directly after the commencement of the depression, and for the first time there became available to private concerns and quasi-municipal corporations Federal money on a loan basis. Immediately 1 very substantial interest in the Arkansas River Basin, the Twin Lakes Reservoir & Canal Co., which has an irrigated area of about 60,000 acres gross with a net of about 54,000 acres, which itself had constructed a number of reservoirs, came to Washington and sought funds for the construction of what was then major transmountain diversion. The company was successful in obtaining the loan. It completed the diversion in 1935.

I think this project probably has been described to the committee. It is called the Independent Pass transmountain diversion or the Twin Lakes transmountain diversion. It has diverted an average of 35,000 acre-feet and has a potential of about 53,000 acre-feet per annum.

All of these supplemental water projects that I have described, which were constructed by private initiative, with the one exception of the Caddoa Reservoir which was constructed by the Corps of Engineers, were for specific areas and for specific projects. None of them was intended to eliminate the basinwide shortages of water supply which exist. There still remains a large shortage of irrigation water supplies and of water supplies for municpial purposes.

With the committee's permisson I would like at this moment to read an excerpt from a paper that I prepared a number of years ago on water-use problems in Colorado.

A new era in water development has commenced which involves the construction of multiple-purpose projects to supply new lands with irrigation water and to provide supplemental water supplies for existing irrigated land and, in some cases, to make more useful the water that is already being used. Such projects include not only features for supplying irrigation water but also for generating hydroelectric energy, for flood control, and for other benefits. The remaining projects are so expensive and so involved both from a physical standpoint and from the standpoint of human relations that they are beyond the ability of individual irrigation districts or mutual ditch companies to construct. It is also beyond their ability, acting alone, to resolve many of the human relations problems which must be resolved before such projects can go to construction.

Whole river basins or major portions thereof, including the municipalities and all industries that will be benefited by such developments, will be called upon to pay their fair proportion of the costs of such projects. Both the Bureau of Reclamation and the Corps of Engineers are being utilized to investigate such major projects in Colorado, and to prepare plans and specifications and supervise the construction of those which have been authorized for construction by

those agencies. The Colorado Water Conservation Board, created by special act in 1937, is actively cooperating with the Bureau of Reclamation, the Corps of Engineers, and other governmental agencies, as well as State agencies and various local organizations, in planning the water development program for Colorado.

The Arkansas River Basin has already entered this era. A number of years ago local interests in the State elicited the aid of the Bureau of Reclamation in making major studies for supplemental water projects to serve that area. Out of those studies finally came the project which is now before this committee, the Fryingpan-Arkansas transmountain diversion project.

The committee has already been told of the policy and review committee that was created by the Colorado Water Conservation Board to work with the Bureau of Reclamation and to compose east slope-west slope differences in connection with the evolution of the plan of the project. The policy and review committee caused to be created an engineering advisory committee to assist in this work. I happen to have been chairman of that engineering advisory committee.

The engineering advisory committee reviewed the estimates of the needs for supplemental water supply in the basin as they had been made by the Bureau of Reclamation. The committee also reviewed the estimates of project water supply. As a result of such reviews there were some changes made in those estimates. Some changes also were made in the physical features of the project as a result of the studies and advice of the engineering advisory committee.

Senator WATKINS. You are talking now of this present project described in this bill?

Mr. TIPTON. That is correct, sir.

Senator WATKINS. May I ask you, Are there any of the existing projects that are uncompleted, not finished, not in operation?

Mr. TIPTON. Of the supplemental water supply projects?

Senator WATKINS. Yes. I mean on the river. Do you have some of these projects, such as we have in some other States, that started up big and wound up bankrupt and were not finished?

Mr. TIPTON. No.

Senator WATKINS. Or which are in difficulty or are partially in operation?

Mr. TIPTON. No, sir. I am not implying that we were not at one time in difficulty, but the supplemental water supply projects that were constructed a number of years ago are all on a good operating basis, all sound. The Twin Lakes transmountain diversion project, which I will come to in a moment, does not divert at the moment its full potential. That is not because the project has not been completed so far as the transmountain diversion is concerned, but it is because there was not provided the required storage capacity on the east slope to regulate and make entirely usable all of the water the project can divert. This project will be made whole by this project. I will describe that when I come to it.

Senator WATKINS. What I had in mind is, Are there any of these projects already existing which will be taken over and purchased in order to make this bigger project feasible?

Mr. TIPTON. No, sir. There will be a relationship between this project and the Twin Lakes transmountain diversion project, which I will describe.

Senator, that will be described more fully when I touch upon replacement storage, because replacement storage sandwiches in between the relationship between this project and the Twin Lakes project.

Senator WATKINS. This project, as I understand, contemplates furnishing additional water supply to many cities and towns in the area.

Mr. TIPTON. That is correct, sir.

Senator WATKINS. What proportion of the water will be used for that purpose?

Mr. TIPTON. About fifteen or seventeen thousand acre-feet of water will be provided for municipal purposes. There will be about 184,000 acre-feet provided for supplemental irrigation.

Senator WATKINS. What is the total of the project?

Mr. TIPTON. There will be diverted from the west slope 69,200 acre-feet.

Senator WATKINS. Then the rest is on the east slope?

Mr. TIPTON. The rest is on the east slope, made up of two increments. One is the storing of floodwater which otherwise would spill from Caddoa Reservoir. This, Senator, answers or is intended to answer—and if it does not, you be sure that it does—the question you posed to Mr. Breitenstein as to whether or not the so-called Pueblo Reservoir unit of this project would operate within the framework of the provisions of the Arkansas River compact between Kansas and Colorado.

Senator JACKSON. Mr. Chairman, might I ask a question of Mr. Tipton with reference to the flow of water of the Colorado River?

As I recall, under the compact that was agreed to by the seven States in 1921 or 1922——

Mr. TIPTON. 1922.

Senator JACKSON. In 1922, the upper basin area was allocated 7½ million acre-feet, and roughly the same amount in the lower basin with the right to an additional million, which would make it about 8½ million acre-feet maximum.

Mr. TIPTON. That is correct, sir.

Senator JACKSON. I was wondering if you could tell the committee whether the allocation made at that time was a realistic one in the light of waterflow in the river at the present time.

Mr. TIPTON. The estimates of water supply made at that time, Senator, in my opinion were not realistic. The allocation made at that time under these two articles of the compact, article III (a) and article III (b) which adds up to 16 million acre-feet, is relaistic under present estimates.

Senator JACKSON. Has the flow declined since 1922?

Mr. TIPTON. Yes, the streamflow over a long period of years passes through periods of high flow and low flow. At one time the term "cycle" was applied to such swings, but it is not a correct word because "cycle" implies periodicity and we do not know yet all the factors which cause periodic periods of high flow. We have had a period of low flow beginning in 1930. We also had a period of low flow on the river and in the west in the 1890's which culminated in about 1904.

Senator JACKSON. Let me put it this way: I assume that the determination as to 16 million acre-feet being available at the time the

compact was made was based on past history of the basin. Has anything happened in the last 31 years to indicate that that determination might not have been accurate in view of changes that have occurred in the overall availability of water in the upper and lower basin since 1922?

Mr. TIPTON. Senator, nothing has happened that indicates that the 16 million acre-feet is not available. That does not mean that it can be available from the direct flow of the stream. During the negotiation of the compact which led to the agreement of 1922 it was contemplated that there would have to be major reservoir construction and operation in the upper basin as well as in the lower basin in order to permit this use of water. In other words, long-time holdover reservoir capacity.

For example, in the upper basin the streamflow records, which are right up to date, indicate that there must be 23 million acre-feet of holdover storage in order to enable the upper basin to comply with its obligation under article III (d) of the compact.

Senator JACKSON. Is that the lower basin requirement?

Mr. TIPTON. That is the obligation of the upper basin, not to deplete the flow of the river at Lee Ferry below 75 million acre-feet in successive 10-year periods. That requires holdover capacity of 23 million acre-feet, and that estimate is up to date. That brings into the picture the present period——

Senator JACKSON. By "holdover" you mean of a reserve?

Mr. TIPTON. You build it up during periods of high runoff.

Senator JACKSON. So you can level it off for the low runoff period?

Mr. TIPTON. Yes, sir. That is true with every river basin where essentially full development of the water supplies is contemplated.

Senator JACKSON. What I am getting at is: Has there been any general water depletion? We had the Geological Survey before us when I was on the House Appropriations Committee and they discussed the general decline in the water table of the country over the past many years owing to tremendous demand upon our water resources for industries and for normal consumptive use which has kept pace with the population increase. I was wondering whether there has been any depletion over the past 31 years.

Mr. TIPTON. Any depletion of that kind, Senator, would be charged against the 16 million acre-feet.

Senator ANDERSON. Would it?

Mr. TIPTON. Yes. any depletion caused by man. The Senator was mentioning depletion caused by man's activities, for example by industries.

Senator ANDERSON. Would be charged against the 16 million or the upper basin's 7½ million?

Mr. TIPTON. Whoever made it. If it were made in the lower basin, it would be charged against the lower basin's 7½ or 8½.

Senator JACKSON. What I want to know was whether nature had slowed down the flow of water. That is what I was getting at, not the actual use.

Mr. TIPTON. That is another question.

Senator WATKINS. I think that is one you ought to elaborate on. If I remember correctly, the recent measurements of the Colorado have indicated that there is not nearly so much water as they thought there was from earlier records.

Mr. TIPTON. I do not want to make any answer too long, but one of the best criteria that we have for the hydrology of the Colorado River and adjacent streams is the stage of Great Salt Lake, with which Senator Watkins is quite familiar. That record has been kept since 1850. The lake has no outlet. So its level reflects fairly well what the precipitation has been over a period of years.

The stage of Great Salt Lake when the record was started in 1850 was quite low but it was ascending. It rose, and then it began to go down precisely as the Colorado River has gone down. It reached a low in 1902 when the West was in the midst of the drought that I previously mentioned.

Senator JACKSON. It started in the nineties and lasted——

Mr. TIPTON. Then the stage rose again. It came up to a high, we will say, in 1917. It started on a decline, and it reached a low about 1934 or 1935. Then the stage leveled off. I think probably it is gradually coming up.

Senator JACKSON. Then the answer is that the amount of water that nature has made available for the Colorado River remains over a given period about the same as it was prior to the 1922 pact?

Mr. TIPTON. So far as we know, sir.

Senator JACKSON. What period would you take to get a norm or an average? About 50 years or 25 years?

Mr. TIPTON. I cannot answer that question.

Senator JACKSON. Is there less snow available for water, less rain?

Mr. TIPTON. That is right. When we come into a period of low runoff it means that nature is providing less precipitation. The flow of the lower Rio Grande right at this moment is at an unprecedented low. The Rio Grande at Laredo, Tex., a few days ago was dry, which never has happened before.

Senator JACKSON. It never has happened before?

Mr. TIPTON. No.

Senator WATKINS. Irrigation has had something to do with that, has it not, upstream diversions?

Mr. TIPTON. Yes.

Senator WATKINS. The same at Great Salt Lake. We kept nearly all the water from running in except winter floods and spring runoffs.

Mr. TIPTON. Let me give you a little more realistic question to your question.

Senator JACKSON. I do not want to put words in your mouth, but I take it that your answer is, forgetting what man has been taking out, because obviously you have to allow for that, nature, according to your answer, is making available roughly the same amount of water in the Colorado now as prior to the 1922 pact.

Mr. TIPTON. We think so. These studies must be based on past history. In order to appraise the situation properly we have taken the stage at Great Salt Lake as a rather rough measure of fluctuations in water supply for the past 100 years.

Getting to your other question, how long a period should be taken, that is related to the amount of reservoir capacity that should be provided on any given stream. With respect to the Colorado River we have found that the 23 million acre-feet of actual holdover storage is required to——

Senator JACKSON. To meet the requirements of the compact downstream. I understand that.

Mr. TIPTON. Taking the water supply as nature has given it to us.

Senator JACKSON. Based on your past records?

Mr. TIPTON. Yes sir, past records up to the present.

Senator JACKSON. What you know about the habits and behavior of the river and its ability to replenish itself?

Mr. TIPTON. That is correct, sir. Based on past records, that is what the answer would be based on.

Senator WATKINS. Without the storage dams it would not be possible for the upper river States to have any water at all for the future use, for exploitation?

Mr. TIPTON. In the lowest 10-year period the upper basin could utilize 4,500,000 acre-feet out of its 7,500,000 acre-feet allocation with present conditions on the stream without any holdover storage.

Senator WATKINS. That is all they would be able to use?

Mr. TIPTON. Yes, sir; that is correct.

Senator WATKINS. It would be absolutely necessary not only to furnish the water downstream but to make it possible for future projects upstream to have these reservoirs?

Mr. TIPTON. That is right, sir. That was contemplated when the compact was negotiated in 1922, and when the Congress approved the compact in 1928 in the Boulder Canyon project. In other words, in order to implement the provisions of the compact and provide that each basin shall utilize its full amount of water, there must be major holdover storage in the upper basin.

Senator ANDERSON. Mr. Tipton, were you familiar with any of the discussions that took place in Santa Fe when the compact was signed? Do you know how much water they thought they were dealing with?

Mr. TIPTON. Twenty-one million acre-feet.

Senator ANDERSON. Did they have records of 30 million acre-feet flows?

Mr. TIPTON. I do not know, sir.

Senator ANDERSON. They did have.

A portion of the compact provides:

> Further equitable apportionment of the benefit uses of the waters of the Colorado River system unapportioned by paragraphs A, B, and C may be made in a manner provided in paragraph G at any time after October 1, 1963.

Mr. TIPTON. Yes, sir.

Senator ANDERSON. Did they expect there was going to be additional water provided at that time?

Mr. TIPTON. I think they did, sir.

Senator ANDERSON. What is the situation now? What was the streamflow in the Colorado River last year?

Mr. TIPTON. I do not know, sir.

Senator ANDERSON. Could it be 13 million acre-feet?

Mr. TIPTON. It could be. It has been as low as 4 million acre-feet.

Senator ANDERSON. How recently?

Mr. TIPTON. In 1934.

Senator ANDERSON. Are you familiar with the fact that temperatures have been rising in the Western States and all over this country steadily during the past few generations?

Mr. TIPTON. No; not through the past 2 or 3 generations.

Senator ANDERSON. Are you sure? The Smithsonian Institution has some very interesting material on that if you would care to look at it.

Mr. TIPTON. Senator, when a dry period occurs, temperatures rise. When a period of better water supply occurs, temperatures drop. That has been happening over the centuries.

Senator ANDERSON. The temperature rises in this country have been accentuated in the last 75 years, so that you have a curve which is beginning to take effect at the present time. I say that because there has been a study made by the Smithsonian Institution and it interested me very much. Have you noticed and watched the cities on the Colorado River during this period? Do you feel there is enough to supply the 75 million acre-feet that the upper division has to supply to the lower basin States?

Mr. TIPTON. With holdover storage, as I mentioned. It cannot do it——

Senator ANDERSON. If it is going to take the entire flow of the river to fill the storage, how do you expect that that will help you in providing 75 million acre-feet? You have to have an average of more than 15 million acre-feet in the river, each year, do you not, considerably more?

Mr. TIPTON. Yes, sir.

Senator ANDERSON. Has there been that in the last 20 years?

Mr. TIPTON. In 1931 to 1940, which is the lowest 10-year period of record, the virgin flow at Lee Ferry, which is the division point between the 2 rivers, is estimated at 11,832,000 acre-feet.

Senator JACKSON. What has it been since 1940?

Mr. TIPTON. I do not have the figures before me.

Senator JACKSON. Has it averaged more than 11 million acre-feet?

Mr. TIPTON. I would say the average has been greater than this. This was the lowest 10-year period of record.

Senator WATKINS. Of course in picking out a project you have to take the supply in the lowest period and give it serious consideration in planning the entire project.

Mr. TIPTON. That is correct, coupled with the reservoir potential that exists. That is the very fashion in which the upper Colorado River storage project has been conceived, taking the actual recorded water supply, routing that water supply through the hypothetical reservoirs, and in that fashion determining the amount of storage required to provide 75 million acre-feet at Lee Ferry in successive 10-year periods.

Understand, I am not saying that is the amount of storage required fully to equate the flow of the stream. That is merely to provide the 75 million acre-feet at Lee Ferry.

Senator WATKINS. Also it is necessary in order to provide any water for the projects that are contemplated in the upper basin States?

Mr. TIPTON. That is correct.

Senator WATKINS. There would not be any water at all for them if you did not have that, because you would have to let it go downstream?

Mr. TIPTON. That is correct.

Senator ANDERSON. I thought we had here in the committee the record of these flows from 1922 on after we signed the compact. There have been very few years prior to 1922 when the flow was extremely low, and the average of the flow from 1897 to 1922 as you

well know, is well above 15 million acre-feet. Since that time it has been well below 15 million acre-feet.

Mr. TIPTON. Senator, if you please, there is another element that enters in. The recorded flow is the measured amount of water that passes Lee Ferry. In order to determine——

Senator ANDERSON. Is that not what you guaranteed in the compact, that 75 million acre-feet will pass Lee Ferry?

Mr. TIPTON. That is right.

Senator ANDERSON. So that is what we are really dealing with, is it not?

Mr. TIPTON. We are dealing with 16 million acre-feet which includes 8½ million acre-feet to the lower basin, 7½ million acre-feet to the upper basin, and then the total water supply of the basin. Do not forget that there is some increment of water supply in the lower basin in addition to that which passes Lee Ferry. If we confine ourselves only to the 75 million acre-feet in successive 10-year periods——

Senator ANDERSON. May I read you the compact?

The States of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years reckoned in continuing progressive series beginning on the first day of October next succeeding the ratification of this compact.

Mr. TIPTON. That is correct.

Senator ANDERSON. So you deal with 75 million acre-feet at Lee Ferry, and not what might be developed below Lee Ferry. Is that not right?

Mr. TIPTON. Under that provision of the compact, that is correct, sir.

Senator ANDERSON. Is there any other provision of the compact that changes that?

Mr. TIPTON. No, sir.

Senator ANDERSON. Why do you say in that provision of the compact? By the compact you do it.

Mr. TIPTON. Let me repeat my answer, Senator.

Senator ANDERSON. I think there is grave danger, if I may say it to you, that the upper basin States are in trouble already. I would have to refer to my lawyer up here at the end of the table. They are residuary legatees or something of that nature. They get what is left.

Mr. TIPTON. We cannot change the terms of the compact.

Senator ANDERSON. No, I am not saying we can. But it is the fact that we cannot change the terms of the compact that has got us in trouble. The lower basin States are going to get 7½ million acre-feet every year. They are to get 75 million acre-feet in a 10-year period.

Mr. TIPTON. That is correct, sir

Senator ANDERSON. The 1 million acre-feet may develop out of the Gila. That was my remembrance. I was at Santa Fe for part of this compact, and I think they counted a million acre-feet from Gila as that extra million that gets it up to 16 million. If you take the flow beginning in 1922, 16, 11, 12, 13, 17, 14, 19, 12, 6, 15, 9, nearly 4, 10, 12, 12, 12, 15, 8, 7, 14, 11, and 11 again here, you do not get much comfort, do you?

Mr. TIPTON. May I repeat, Senator, by taking the very figures that you have read, accounting for the uses that are already being made in the upper basin and which were made during those years, it requires

23 million acre-feet of active holdover storage to be provided in the upper basin before we could meet the obligation spelled out for us under article III (d) of the compact. That is an engineering problem. That is the way it has been worked out.

The upper Colorado River storage project provides for a total capacity of 48 million acre-feet. That includes some dead storage for minimum power head, and silt detention storage for 200 years. So there is quite a little cushion so far as storage is concerned.

Do not for a minute understand that I am saying as an engineer that we might not have worse years than we have had heretofore.

Senator MILLIKIN. You might have better years, too.

Mr. TIPTON. And we might have better years.

Senator ANDERSON. I am fully in sympathy with the Colorado River storage project, and I am very happy to cooperate with the distinguished Senator who now sits at the end of this table, Senator Millikin, in trying to work out a bill that we can get through the Congress of the United States, but I also recognize that water supplies are going down in the Colorado River, and I attribute it in some degree to the fact that there is this constant rise in temperatures which scientists believe may change Greenland and various other areas into very decent climates in the course of many, many years. They are gradually reducing the water supply in the Colorado River.

While I am very anxious to get this storage project done, I just wondered if your answer to Senator Jackson that nothing had happened in the Colorado River that indicates any scarcity of water since 1922 is exactly accurate.

Mr. TIPTON. All I can do is to again repeat that the past history of all streams indicates periods of low runoff, and periods of high runoff. We have a long history of a measure of the hydrology of the Southwest by records of tree rings. From such statistics we know there was a 23-year drought period in the Southwest between the years 1276 and 1299. Such 23-year drought period is the most severe of which we have any knowledge.

Senator ANDERSON. Was it as good as the recent periods?

Mr. TIPTON. I would say worse than the recent years.

Senator ANDERSON. There is no way of measuring?

Mr. TIPTON. No.

Senator ANDERSON. From 1938 to 1948 we have averaged about 13 million feet. I am trying to find out, even if you have storage, when the river does not carry any more water even though you have it stored up here, how does that generate additional supplies of water?

Mr. TIPTON. It does not generate additional supplies. It captures the water from the high years which preceded those years and carries it through. I think there is a 17-year carryover in this storage plan at the present time.

Senator ANDERSON. I am worried only when we start putting the money in the bank. There has not been a 10-year period since 1922 when you could dare accumulate one drop of water. Is that not correct?

Mr. TIPTON. No that is not correct. All flow above 7,500,000 acre-feet per annum plus water not reasonably needed in the lower basin for domestic and agricultural purposes could be stored.

Senator ANDERSON. Since 1922, all the way through to 1951. That is 30 years.

Mr. TIPTON. I am not testifying on the Colorado River storage project: I am testifying on the Fryingpan-Arkansas, which is a very small segment of the whole picture.

Senator ANDERSON. I realize it is.

Mr. TIPTON. I am just as concerned as anybody could possibly be about the facilities which will be required to enable the upper basin to make its full use of that which was apportioned to it by the Colorado River compact. It is primarily an engineering problem which all of us are following very closely.

Senator ANDERSON. May I just say that you cannot just take the Lee Ferry flow as measured here. Say it was 11½ million feet in 1945. Did we not provide for some water for Mexico by a treaty?

Mr. TIPTON. That is correct, sir.

Senator ANDERSON. It is one that I think we ought to try to buy back from Mexico. Whatever it costs, we ought to try to get it back. We should never have given it to Mexico in the first place.

Senator MILLIKIN. Senator Anderson, I spent a month debating that in the Senate. I hope to God that we are not going to open that in this hearing.

Senator ANDERSON. I just wish that they had listened to some of us who debated it as vigorously as you did. But that million and a half acre-feet has to come out of the 11½ million, dropping it below 10 million acre-feet. Seven and a half million acre-feet of that has to be to the lower division. What is left for the upper division?

Mr. TIPTON. Senator, if we want to analyze that, the million and a half acre-feet comes out of what the compact calls or what we call article III (c) water.

Senator ANDERSON. Article III (c) water is surplus water, and if you have not got as much as you need, what is surplus?

Mr. TIPTON. If you do not have enough surplus, then the burden is half on the upper basin and half on the lower basin.

Senator ANDERSON. That is right. The Mexican treaty has to be divided between the upper and lower basins.

Mr. TIPTON. If there is not enough surplus over and above what is allocated under article III (a) and (b), then any deficiency must be shared equally by the basins.

Senator ANDERSON. It is not much comfort if there is only 11 million acre-feet in the river to recognize that the lower division gets 7½ million and the upper division supposedly 3½ million. We would have to take 800 million of ours and they would have to take 800 million of theirs, but it still would not leave us very much water in the upper division. The only reason I asked about it was that I am a little worried over the answer we got the other day that this was surplus water that was going to be used. There is not much surplus water, is there? Actually, it is an appropriation by the State of Colorado of very essential water which can be used one place or the other.

I think the State of Colorado is doing the wise thing and is maybe using it in the right place. I am not trying to question the use that Colorado is making of it, but we do not have any surplus water anywhere, do we, up there, when our obligations are considered?

Mr. TIPTON. Senator, speaking from the standpoint of Colorado itself and Colorado's share, whatever the share might be, we have unencumbered water, we have unappropriated water out of our share,

subject to appropriation by anybody under the laws of the State of Colorado.

Senator ANDERSON. I agree with that; I do not question that.

Mr. TIPTON. That would be subject to appropriation by the sponsors of this project without regard to west slope relationships except that we do have a State policy which brings this under that State policy because it is federally financed, which I will go into in a moment.

Senator ANDERSON. What are the water uses of the upper basin States?

Mr. TIPTON. About 2 million acre-feet.

Senator ANDERSON. We are close, are we not?

Mr. TIPTON. Without the storage project in the lowest 10-year period of record, we still would have 2½ to go.

Senator ANDERSON. Would you not have to shut down even your 2 million flow in order to put water in storage?

Mr. TIPTON. No, sir. Categorically, no.

Senator ANDERSON. Why not? There is only so much water in the river. You cannot deplete the flow at Lee Ferry less than 7½ million acre-feet per year over a 10-year period.

Mr. TIPTON. That is right.

Mr. BREITENSTEIN. No; 75 million, not 7½.

Senator ANDERSON. I said you cannot deplete the flow less than 7½ million acre-feet per year for a 10-year period.

Mr. BREITENSTEIN. Yes, you can.

Senator ANDERSON. How can you?

Mr. BREITENSTEIN. You have a flow of 11½ million acre-feet a year. You have to deliver only 7½. You can store the rest, provided over the 10-year period you have an average.

Senator ANDERSON. Certainly.

Mr. BREITENSTEIN. You can store the excess flows in any year.

Senator MILLIKIN. Could we get back to the Fryingpan-Arkansas project? Mr. Tipton, do we have enough water on the western slope to supply the Fryingpan-Arkansas project?

Mr. TIPTON. Yes, unencumbered water on the western slope is much greater than sufficient.

Senator MILLIKIN. Do the people of Colorado on the western slope agree that this diversion may be made regardless of other questions as to other diversions?

Mr. TIPTON. That is correct, sir. Those who were appointed to consider this particular problem by substantial interests on the western slope agree that that can be done.

Senator MILLIKIN. Very well.

Mr. TIPTON. I think at this point it might be a good point to bring in the availability of water, for the record.

As has been suggested, 51.75 percent of the water allocated to the upper basin has been allocated to Colorado by the upper Colorado River basin compact. That means an allocation of about 3,850,000 acre-feet. Present uses plus water by projects which have not been completed will bring the present uses up to, in round numbers, 1,600,000 acre-feet. That leaves unencumbered in Colorado, 2,250,000 acre-feet of her share of the water subject to appropriation.

However, as has been said, we cannot use all of that water unless the Colorado River storage project is constructed. The project will

cause some loss of water by evaporation. Colorado must stand her share of the evaporation, which is estimated in round numbers as some 400,000 acre-feet. While that is not encumbered, nevertheless any future appropriator would be unwise in his development if his appropriation were to fall into a block of water which included that.

So that leaves remaining 1,850,000 acre-feet as Colorado's share, subject to appropriation by anyone on the west slope or east slope.

The proposed project water supply therefore is well within Colorado's share. We do have however the west slope-east slope situation and we do have the State policy which is spelled out in the Water Conservancy Act of Colorado, the principles of which have been made a part of the operating rules which were agreed upon by interests in both slopes.

Senator MILLIKIN. The operating rules are incorporated in this bill, by reference.

Mr. TIPTON. Yes, sir.

It provides that any diversion in essence financed by Federal funds shall not, of course, interfere with existing uses on the west slope, which under laws of the State of Colorado could not be interfered with anyway, but would not make more expensive any future projects on the west slope which might be constructed below that particular diversion, and that works shall be provided, if necessary, to see that the future west slope development below the point of diversion is not made more expensive or is not interfered with.

That brings into the picture as an essential feature of the project the Aspen Reservoir. It was determined that the Aspen Reservoir was the best facility to carry out the State policy. That reservoir has a total capacity of 28,000 acre-feet of which only 3,100 acre-feet would be necessary for true replacement purposes. That replacement purpose is the amount of storage required to permit the Fryingpan-Arkansas transmountain diversion to make diversions up to its complete physical potential without interfering with any existing uses on the west slope. That is something that it would be necessary for it to provide in any event.

There is also in that an increment of storage that will protect future potential on the west slope that otherwise would be interfered with by this project.

There is in the reservoir what I choose to call a noncontingent replacement capacity of 9,200 acre-feet, a contingent replacement capacity of 7,100 acre-feet, leaving an unassigned capacity of some 11,700 acre-feet.

Mr. Chairman, I would like to submit for the record that portion of my written statement which starts at the middle of page 7, the paragraph starting, "In order to protect west slope potential uses," and ending at the top of page 11, the incomplete paragraph at the top of page 11. That statement gives in detail a description of the increments of capacity in the Aspen replacement reservoir. I do not think it is necessary to read all that into the record. I would be glad to answer any questions in connection with it.

Senator MILLIKIN. That will be done.

(The portion of the statement referred to follows:)

In order to protect west slope potential uses of water which might be impaired by the operation of a transmountain diversion, the Water Conservancy Act of Colorado provides the following which also is incorporated in the rules for operating the project, which were agreed upon by west slope and east slope interests:

"* * * 'Provided, however, That any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado River, and its tributaries in Colorado, by any district created under this chapter, shall be subject to the provisions of the Colorado River Compact and the Boulder Canyon Project Act, as amended; that any such works or facilities shall be designed, constructed and operated in such a manner that the present appropriations of water, and in addition thereto prospective uses of water for irrigation and other beneficial consumptive-use purposes, including consumptive uses for domestic, mining, and industrial purposes, within the natural basin of the Colorado River in the State of Colorado, from which water is exported, will not be impaired nor increased in cost at the expense of the water users within the said natural basin; and that the facilities and other means for the accomplishment of said purpose shall be incorporated in, and made a part of, any project plans for the exportation of water from said natural basin in Colorado.' "

The facility that could best accomplish this purpose is a replacement reservoir to be located about 1 mile above the city of Aspen, Colo. The total capacity of this proposed reservoir is 28,000 acre-feet which is much greater than the true replacement requirement. By studying the water supply and the operation of the project, the Engineering Advisory Committee found the following to be the necessary increments of replacement capacity and desirable increments of capacity for other purposes:

| | *Capacity in acre-feet* |
|---|---|
| Replacement purposes: | |
| 1. Fryingpan-Arkansas project, summer diversions | 3,100 |
| 2. Ultimate Twin Lakes diversions (Independence Pass) | 6,100 |
| 3. Noncontingent replacement capacity | 9,200 |
| 4. Difficult Creek (an increment of water which in the future might be transported from the Roaring Fork watershed to the Gunnison for ultimate transmountain diversion to the Arkansas) | 2,100 |
| 5. Possible winter diversions by the Fryingpan-Arkansas project | 5,000 |
| 6. Contingent replacement | 7,100 |
| 7. Total replacement capacity | 16,300 |
| Other purposes: | |
| 8. Supply natural shortages of water supply at or near Aspen | 6,100 |
| 9. Supply possible future industrial uses | 1,700 |
| 10. Total for other purposes | 7,800 |
| 11. Total for all uses | 24,100 |
| 12. Unassigned | 3,900 |
| 13. Total capacity | 28,000 |

The first increment of replacement capacity, 3,100 acre-feet, is necessary to permit the project to divert all of the water available to it during the summer period without interfering with present or future uses below the points of diversion on the western slope.

The existing Independence Pass, or Twin Lakes, transmountain diversion cannot divert all of the water physically available to the system at present because of interference at certain times of the year with prior uses on the western slope and because of the lack of reservoir capacity on the east slope. Because of the value of imported water for the generation of energy by the project, it was deemed economical to provide sufficient replacement storage capacity in the Aspen Reservoir to permit the diversion of the total amount of water physically available to the Independence Pass transmountain diversion. In order to do this, it was found that 5,100 acre-feet of replacement capacity would be required in the Aspen Reservoir.

The total of these two replacement items, amounting to 9,200 acre-feet, represents the true noncontingent replacement capacity of the reservoir.

With respect to the operation of the existing Independence Pass transmountain diversion, one feature of the project plan contemplates that there will be left in the tributaries of the Roaring Fork below the collection system of the Independ-

ence Pass project sufficient water to take care of fish requirements, this water to be replaced in the Twin Lakes Reservoir by water diverted from the Fryingpan. This arrangement will require an agreement between the entity financing the Fryingpan-Arkansas project and the Twin Lakes Reservoir & Canal Co., the owners and operators of the Independence Pass project.

Prior studies of transmountain diversions made by the United States Bureau of Reclamation indicated that, if a diversion is constructed sometime in the future from the Gunnison River to the Arkansas River, it would be practicable and desirable to divert some of the water from Difficult Creek which is a tributary of the Roaring Fork into the Gunnison River Basin and thence into the Arkansas River Basin. An increment of replacement capacity amounting to 2,100 acre-feet was provided in Aspen Reservoir to replace the amount of water that might be diverted from Difficult Creek during those periods when there would otherwise be a conflict with interests in the Roaring Fork Basin and on the main stem of the Colorado River.

It is improbable that it will be feasible to operate the Fryingpan collection system during winter periods; however, to take care of the possible contingency that winter operation might become feasible, 5,000 acre-feet of replacement capacity was provided in the Aspen Reservoir to eliminate the adverse effect of the winter diversions on possible future industrial development on the Colorado River below the mouth of the Roaring Fork. There has therefore been provided 7,100 acre-feet of what I choose to call contingent replacement capacity, which may never be utilized for that purpose. This results in a total replacement capacity, both contingent and noncontingent, of 16,300 acre-feet.

Studies were made to determine the amount of reservoir capacity required to take care of natural shortages at or near Aspen. Assuming the full use of water now decreed in that area, it was found that 6,100 acre-feet of reservoir capacity would be required to take care of such shortages during the year of lowest runoff of the study period. Another increment of capacity, 1,700 acre-feet, was added to supply possible future industrial purposes. These 2 items amount to a total of 7,800 acre-feet of capacity. That portion of the contingent replacement capacity in the reservoir which in the future might not be required for replacement purposes can also be used for other purposes.

The total required capacity for all the uses which I have described is 24,100 acre-feet, which may be compared with the 28,000 acre-foot capacity that will be provided in the reservoir. It was the conclusion of the Engineering Advisory Committee, and it is my conclusion, that the 28,000 acre-feet of capacity to be provided for in the Aspen Reservoir is more than ample for replacement purposes.

Mr. TIPTON. With respect to the estimated cost of the project, I have had my office review in detail the unit prices used by the Bureau of Reclamation in estimating the cost of construction of the Fryingpan-Arkansas transmountain diversion project. In general, it is our conclusion that the unit prices are adequate, based on present-day construction costs.

I would like to read into the record the memorandum prepared for me by two of my staff who are quite competent in estimating the cost of projects. It is very short. It is a summary of their findings:

> The total estimated cost appears to be adequate. While there are single features that have definitely low unit prices and others that have definitely high unit prices, they appear to balance each other.
>
> In making the examination, no account was taken of the contingency items, which vary from 20 to 25 percent. This amount for contingencies appears to be ample and should provide for any normal price increases over the period set for construction.

Senator MILLIKIN. Will you explain that a little more. Does each major item of cost have a contingency item, or is there an aggregate contingency item in there?

Mr. TIPTON. Each feature has a contingency item.

Senator JACKSON. What percentage is that, normally?

Mr. TIPTON. In this particular estimate it is set up as 20 to 25 percent. For some features it is 20 percent; for other features 25 percent.

Senator JACKSON. What does it average out, between 20 and 25?

Mr. TIPTON. Yes, sir.

Senator JACKSON. That is a substantial contingency.

Mr. TIPTON (reading):

> This amount for contingencies appears to be ample and should provide for any normal price increases over the period set for construction. On each individual estimate sheet has been indicated our opinion of each unit price. Due to the lack of sufficient information, no check was made on the cost of electric power distribution features.
>
> Attached are shown, for comparative purposes, bids on projects involving some large features similar to those of the project. No examination was made of administration and engineering costs.

Submitted by Robert T. Crabtree and J. H. Sanford, June 5, 1953.

Senator MILLIKIN. Those men studied this project in detail?

Mr. TIPTON. Yes, sir.

Senator MILLIKIN. They followed the footsteps of the Bureau so far as the Bureau estimates were concerned?

Mr. TIPTON. Yes, sir.

Senator MILLIKIN. They checked those?

Mr. TIPTON. Yes, sir.

Senator MILLIKIN. They checked all of those?

Mr. TIPTON. Yes, sir.

That, Mr. Chairman, was with respect to the unit costs. Obviously, it was not physically possible to check all of the quantities. I was chairman of the engineering advisory committee that followed the evolution of this project very carefully, and in view of what had happened on the Colorado-Big Thompson project, we were at all times looking over the shoulders of the Bureau.

I myself feel that the quantities are generally adequate. We did find some features that we considered overestimated, such as the water treatment plant for municipal purposes.

Senator ANDERSON. Your firm, then, did not participate in the Big Thompson work at any stage as consultants?

Mr. TIPTON. No, sir. I made the original report for the Colorado-Big Thompson as a private consultant.

Senator ANDERSON. What did you estimate its cost to be?

Mr. TIPTON. I do not remember, sir.

Senator ANDERSON. It was not $200 million, was it?

Mr. TIPTON. No.

Senator ANDERSON. The original estimate was how much?

Mr. TIPTON. $44 million.

Senator ANDERSON. At what figure did it end up?

Mr. TIPTON. I do not know; $162 million, we will say.

Senator ANDERSON. Senator Russell made the statement yesterday that he thought it now had gone over $200 million, but it has not gone that far?

Mr. TIPTON. I do not think so, Senator. I am still consultant for the entity——

Senator ANDERSON. Is there not money still being put into it?

Mr. TIPTON. It is not yet complete. $162 million, I think, is the last estimate. Possibly Mr. Tomlinson might give us that. Is that correct?

Mr. TOMLINSON. No, sir; I do not have any ready figures, but I will be glad to get that and submit it for the record and furnish it to you, if you like, sir.

Senator ANDERSON. You would not have, then, any idea what your original report as consultant was?

Mr. TIPTON. I do not remember. It is a different project from that which the Bureau finally approved.

Senator ANDERSON. Is there any assurance that this tunneling, and so forth, which is a similar project, will not also raise pretty substantially? We have just had another example of it in the Matanuska project up in Alaska, which has greatly overrun, where they tunneled through a mountain.

Mr. TIPTON. All I am telling this committee is that the engineering advisory committee watched the work of the Bureau very carefully. Very competent people in my own office have reviewed the unit prices, not the quantities, and find them adequate. That is my testimony.

Senator ANDERSON. The rise is from $147 million to $172 million from October 1949 to January of 1953. Is that in line with general rises in construction costs?

Mr. TIPTON. I think that is correct.

With respect to the Colorado-Big Thompson project, there were two major elements involved that had to do with the rise in costs. One was the actual rise in construction costs from the time the project started until it was completed. That was quite substantial. Another quite material factor was the change in plan of the project from that originally conceived by the Bureau and the plan as originally adopted for construction. The original plan contemplated the carrying of the water on the east slope through open canals, through a series of powerplants. It was finally realized that no firm energy could be derived from a project built in that fashion. No firm power would be available during the wintertime.

The project ended up having all the water on the east side being carried through tunnels or siphons. From an engineering standpoint it is a very excellent project. It is a very workable project.

Those two elements with respect to the Colorado-Big Thompson are what made the terrific increase in costs.

Senator MILLIKIN. You had that overrun in mind when you analyzed these costs?

Mr. TIPTON. Yes. In this, the one factor of the increase in construction costs is not present because the estimate is based on the present-day construction costs.

Senator MILLIKIN. I mean the overrun on the Big Thompson made you especially cautious about this project?

Mr. TIPTON. That is correct. On both factors. The workability of this project was examined very carefully by the engineering advisory committee. I even asked the Bureau of Reclamation to set up a board to appraise whether or not the project on the east side could successfully operate in the wintertime. They did set up such a board, and the board made a report.

Senator ANDERSON. Will you tunnel through the mountain here as the Big Thompson did?

Mr. TIPTON. Yes, a shorter tunnel.

Senator ANDERSON. How much shorter?

Mr. TIPTON. The Big Thompson tunnel is 13.1 miles. This is 6 miles.

Senator ANDERSON. Do you think if the true facts of the Big Thompson project had been presented to the Congress, it would have approved it?

Mr. TIPTON. I have no way, Senator, of knowing what the Congress would have done.

Senator ANDERSON. Would you, as an engineer, have recommended it at $167 million as feasible?

Mr. TIPTON. Under present policies and procedures, it would be feasible. I, as an engineer, might have had my fingers crossed, under what I consider to be sound procedure, but under present procedures and policies——

Senator ANDERSON. It would be feasible. Those are the procedures that are being assigned to this project as to its feasibility? The same criteria?

Mr. TIPTON. I think they are somewhat different.

Senator MILLIKIN. Your interest is not only from the Federal standpoint, but in the last analysis, the people of Colorado will have to pay for this project through power sales and water sales for municipal purposes.

Mr. TIPTON. That is correct, sir.

Senator MILLIKIN. So you are out to protect the people of Colorado, who are the ultimate bagholders, as well as the Federal Government.

Mr. TIPTON. That is correct. As was explained this morning by Mr. Breitenstein, a district must be formed, a repayment contract must be negotiated, and what is extremely important, that repayment contract must be voted upon by the electors in the district. If it is voted down, there is no project. If the repayment contract is approved, then there is a second step: There must be negotiated by the directors of the water conservation district with the potential water users, individual water use contracts.

Senator MILLIKIN. Further questions?

Mr. TOMLINSON. Mr. Chairman, I have that figure regarding the cost of the Colorado-Big Thompson. The total estimated cost as of now is $164,131,000. There has been spent to date, of that amount, approximately $154 million, leaving a balance to complete of around $10 million.

Senator MILLIKIN. Thank you very much.

Mr. TIPTON. Mr. Chairman, my conclusion after having been intimately identified with the evolution of the project as a member of the engineering advisory committee of the policy and review committee, is that the project is well conceived from an engineering standpoint, and that it will provide the maximum benefits from the water supplies made available by it. The project is multiple-purpose. The benefits that will result from its operation include the generation of hydroelectric energy, the provision of supplemental irrigation water supplies and needed municipal water supplies, the reduction of flood damages between Pueblo and Caddoa Reservoir, and the prolongation of the life of some of the lower reservoirs by silt detention in the Pueblo unit of the project.

On behalf of the Colorado Water Conservation Board, for which I am appearing, I urge sympathetic consideration of the project by this committee.

Senator MILLIKIN. Thank you very much.

Mr. Ely?

Sit down, gentlemen. It is good to see you again.

Mr. ELY. Mr. Matthew will testify first. Would you like us both to appear at the same time?

## STATEMENT OF RAYMOND MATTHEW, CHIEF ENGINEER, COLORADO RIVER BOARD OF CALIFORNIA

Mr. MATTHEW. Mr. Chairman and gentlemen of the committee, my name is Raymond Matthew. I am chief engineer of the Colorado River Board of California. I appear here on behalf of the Colorado River Board of California, which is a State agency created by act of the legislature in 1937. The board is charged with the responsibility for protecting the interests of California in the waters of the Colorado River. It is composed of six members appointed by the governor, each representing one of the public agencies having established rights to the use of water or power from the Colorado River.

Proposed project: The proposed Fryingpan-Arkansas project sought to be authorized under S. 964, 83d Congress, 1st session, would divert water from the Colorado River Basin to the Arkansas River Basin in Colorado and conserve and reregulate Arkansas River waters in combination with imported Colorado River Basin water, for the purposes of supplying supplemental irrigation water to 309,000 acres of presently irrigated lands in the Arkansas River Basin, furnishing additional municipal water supplies and generating hydroelectric power. Transmountain diversions would be made from Hunter Creek and Fryingpan River, tributaries of the Roaring Fork River branch of the Colorado River in west central Colorado.

The plans for the proposed project are summarized in Senate Document 106, 82d Congress, 2d session, to which the pending bill refers; but are more fully described with substantiating materials in the report of the Bureau of Reclamation, Project Planning Report No. 7–8a. 49–1, dated January 1950, entitled "Initial Development, Roaring Fork Diversion, Gunnison-Arkansas Project," which was approved and adopted by the Secretary of the Interior on May 4, 1951. It is understood that cost estimates and related financial aspects have recently been revised.

Official comments of State of California: The project planning report referred to was submitted in May 1951 to interested States, and Federal departments and agencies, for review and comment under the provisions of the Flood Control Act of 1944. The views and recommendations of the State of California, including the comments of the Colorado River Board of California, were submitted to the Secretary of the Interior on August 27, 1951. I might say if the committee hasn't a copy of these comments in the record, I offer it for the record with the request that it be inserted along with my statement.

Senator MILLIKIN. It will be.

(Document referred to filed with the committee.)

Mr. MATTHEW. It will be noted that the State of California in its comments favors the authorization of the proposed project, provided it "qualifies under criteria, policies and procedures established by the Congress," and provided "the diversion and utilization of the waters of the Colorado River System by and through the project works will not impair the rights of the State of California or any of its agencies

to the waters of the system as defined and set forth in the Colorado River compact and related documents and laws, or will not adversely affect the quality of such waters to which California has rights.

Senator ANDERSON. Who is going to make that finding?

Mr. MATTHEW. I presume that finally it may require adjudication by the courts.

Senator ANDERSON. You mean the project will be held up until there has been a court adjudication?

Mr. MATTHEW. No, sir, not this project.

Senator JACKSON. Do you contemplate litigation if this project is authorized?

Mr. MATTHEW. No, sir. There is already one case before the United States Supreme Court on the river, Arizona versus California, which is now pending.

Senator MILLIKIN. One of the purposes of the Flood Control Act of 1944 was to bring to the Congress, which at least has the initial judgment in these matters, those objections and/or affirmances which States might present. So it is entirely proper that the State of California discuss its comments on this project.

Senator ANDERSON. Your last line reads:

will not adversely affect the quality.

I do not know whether you mean quality or quantity—

quality of such waters to which California has rights.

Mr. MATTHEW. It means exactly what it says, quality. That will be explained.

Senator ANDERSON. Will you explain what those last few words mean?

Senator MILLIKIN. Will you come to that in normal course?

Mr. MATTHEW. I will come to that in my statement a little bit later on and will explain that.

Interest of Colorado River Board of California: The primary interest of the Colorado River Board of California in this proposed development is in certain basic factors involved therein affecting or relating to water supply and the rights of California and its agencies in and to the use of Colorado River water. I appear here, therefore, to emphasize those basic factors and the need for certain clarifications in the interest of protecting California's rights.

Limitation in project scope: The Bureau's report above referred to states that the Roaring Fork diversion is planned as a completely independent project. Water proposed to be diverted from the Colorado River Basin would be taken entirely from the headwaters of the Roaring Fork River, a tributary of the Colorado River not connected with the Gunnison River.

However, the report referred to also states that the Roaring Fork diversion could become the first stage of a much larger potential Gunnison-Arkansas project which would involve the exportation of a relatively large quantity of Colorado River water, possibly as much as 900,000 acre-feet or more annually according to the Bureau's report on the Colorado River, House Document 419, 80th Congress, 1st session. The regional director of the Bureau of Reclamation recommends the appropriation of funds for the continued investigation of the comprehensive plan.

The proposed project described in the Bureau's report, as summarized in Senate Document 106, 82d Congress, 2d session, to which the pending bill refers, has been redesignated as the Fryingpan-Arkansas project. However, the language of the pending bill might be construed as giving blank-check authorization for substantial modifications and additions to the works described in Senate Document 106.

Any implication that the project proposed to be authorized by S. 964 is to be the forerunner of a much larger project for exportation of Colorado River water should be eliminated. Any request for funds to investigate the larger potential Gunnison-Arkansas diversion should be dissociated from the request for authorization of the Fryingpan-Arkansas project.

It is the position of the Colorado River Board of California that should the proposed Fryingpan-Arkansas project be authorized by the Congress, the legislation should, as recommended by the regional director, include suitable language providing that such authorization shall constitute no commitment, real or implied, to further exportation of water from the Colorado River system.

Availability of water supply from Colorado River system:

The proposed project contemplates the transmountain diversion of Colorado River system waters, with resulting estimated average annual consumptive use of 90,100 acre-feet. This quantity, of itself, is evidently within the entitlement of the State of Colorado under the upper basin compact; but the full list of claimant projects in Colorado, and their water requirements, has not yet been determined or made known.

The report states that streamflow in the diversion area on the western slope is in excess of present utilization in that area and that during the period October 1910, through September 1944, flows averaging approximately 84,100 acre-feet a year were available for diversion to the eastern slope. However, the report does not contain sufficient evidence to substantiate the conclusion regarding the physical and legal availability of water in relation to the needs of existing and other potential projects. Also, it does not reveal the probable variation in annual amounts that would have to be diverted in order to average 69,200 acre-feet a year through the project tunnel and 14,900 acre-feet a year through the Twin Lakes Co. system. It appears there would be years in which the amount of water available for diversion from the Roaring Fork tributaries would be less than the contemplated average diversion, necessitating diversions above average in other years in order to maintain the average set up in the report as the basis for design of the project.

This project and its proposed operation thus involves one of the questions of interpretation of the Colorado River compact, which concerns California, namely, whether uses chargeable against compact apportionment are to be computed on an actual annual basis or a hypothetical average basis.

It is the position of the Colorado River Board of California that the Colorado River compact under the apportionment made by article III (a) entitles the upper basin to the beneficial consumptive use of 7,500,000 acre-feet, as a maximum in any one year and not to an average of that amount reckoned over a period of years; and that such consumptive use is to be measured at places of use in the natural

basin or at points of diversion in cases of transmountain export, and not in terms of depletion at some distant downstream point on the main Colorado River such as Lee Ferry.

It is further the position of the Colorado River Board of California that if the proposed project be authorized, the legislation should contain suitable language to make it clear that the Congress does not approve or disapprove any interpretations of the Colorado River compact such as may be assumed or implied in the pending bill or in the report of the Bureau of Reclamation on the proposed project.

Quality of water: a problem of great concern and significance to the water users in the Colorado River Basin, especially those in the lower basin, is the effect of existing and potentially larger future export diversions of water from the upper Colorado River Basin upon the quality of water remaining in the Colorado River system. Generally the water for export is and will be diverted at high altitudes where the streamflow is much better in quality than in the lower parts of the system, and the diversion of relatively pure water leaves a higher concentration of minerals in the residual flow.

It appears that the overall effect of the increased diversion proposed by the Fryingpan-Arkansas project would be small. Nevertheless, in view of the allusions to the much larger potential diversion of the proposed Gunnison-Arkansas project which the Bureau report on the Colorado River shows might be in excess of 900,000 acre-feet annually, the principles involved are vital and should be thoroughly examined, analyzed and reported upon in connection with this project together with other proposed developments and uses of the water resources of the Colorado River Basin.

It is the position of the Colorado River Board of California that the Colorado River compact intends that the water available for use thereunder in the lower basin shall be suitable in quality for all necessary purposes. Therefore, it is further the Board's position that additional projects for exportation of water from the upper Colorado River Basin should be authorized only after thorough investigation of the problem of quality of water and only after satisfactory evidence is presented that the proposed developments would have no harmful effect upon the quality of water remaining for use within the lower basin.

Control of export diversions: The Colorado River compact limits use of Colorado River water to the seven Colorado River Basin States. With exportation of any large quantity of Colorado River water to the Arkansas River, substantial return flows to the Arkansas may be experienced.

It is estimated in the report that, under project operation, return flow in excess of 40 percent of headgate diversion may be expected. With such expectancy it appears possible that return flow from the Colorado River water diverted at canal headgates might escape past the Colorado State boundary unless carefully controlled. Such escape beyond the boundaries of an upper basin State of any Colorado River system water would constitute a violation of the provisions of the Colorado River compact.

It is the position of the Colorado River Board of California that, should the proposed project be authorized by the Congress, the legislation should contain suitable language requiring the State of Colorado to give adequate assurances that any water exported from the Colorado River system to the Arkansas River Basin will be consumptively used

in Colorado, and to be responsible for controlling the return flow and preventing the escape of any Colorado River system water outside the State.

In that connection, Mr. Chairman, in appearing before the House committee a few days ago I made mention of the fact that I saw a news item in one of the Colorado papers a year or so ago quoting Judge Stone in which he seemed to take this same position, warning the State of Kansas, as I recall the article, that they could not expect to obtain any water from Colorado River Basin sources out of this proposed project. So I assume the State of Colorado would probably be entirely agreeable to taking over that responsibility.

That concludes my statement, Mr. Chairman.

Senator MILLIKIN. Would you mind making a little more specific the question of quality of water? Are you referring to salinity?

Mr. MATTHEW. Yes, sir; to mineral content.

Senator MILLIKIN. What is your contention as to salinity?

Mr. MATTHEW. Basically our contention is that under the compact it was obviously intended that in apportioning water to the lower basin and to the upper basin as well, it meant not only a certain quantity of water to each basin, but that that water would be of usable quality.

Senator MILLIKIN. Would you demonstrate that by language of the compact?

Mr. MATTHEW. As far as I know, the compact is silent as far as mentioning quality of water, except that I think it seems to be inherent in the compact in several ways. For instance, there is one provision of the compact in particular which I might call your attention to, article VIII, which says present perfected rights shall remain unimpaired by the compact, words to that effect. Obviously, that means unimpaired not only as to quantity but also quality. There were large perfected rights at the time the compact was negotiated in 1922.

Senator JACKSON. Are you not getting into some pretty fine distinctions if you are going to start qualifying the water that flows downstream? I understand your point is that the water in the upper area of the basin is much purer than it is coming in at lower points in the basin. Is that right?

Mr. MATTHEW. That is correct.

Senator JACKSON. It looks like Colorado is making the greatest contribution to purity, then.

Mr. MATTHEW. That is very true. The purest water comes from the high mountains, the high mountain watersheds of the Rockies.

Senator JACKSON. Maybe they ought to share and share alike?

Senator MILLIKIN. By the time that water gets down to California it will have an increasing amount of salinity and you will add to the salinity in California by its use there. How will you purify the water for Mexico?

Mr. MATTHEW. That is very interesting that you would bring up the question of Mexico.

Senator MILLIKIN. Just answer that question without bringing up the question of Mexico.

Mr. MATTHEW. The element of quality of water entered into the debates on the Mexican water treaty as you know. I am not here to state how the water would be purified for Mexico. It might

entail delivering a great deal more fresh water from sources in the Colorado River Basin in order to get a suitable quality for Mexico under the Mexican Treaty.

Senator MILLIKIN. Therefore you would reason that you would be entitled to more water from the upper States.

Mr. MATTHEW. It might require more fresh water from the upper reaches.

Senator MILLIKIN. Does it not follow by the same process of reasoning that the upper States, who you claim are obligated to purify, should have more water for that purpose?

Senator JACKSON. I was just going to say if we ought to reallocate the water on the basis of their contribution to purity, Colorado would get a greater share.

Senator MILLIKIN. If you have to give more water to California so she can purify her water to give it to Mexico, all the upper basin States are entitled to more water so they can deliver pure water to California. That is perfectly obvious, is it not?

Mr. MATTHEW. Of course, Mr. Chairman, the upper basin has an obligation under the Mexican Treaty, too, as well as the lower basin.

Senator MILLIKIN. Yes, but we do not intend to give them saline-free water. We are not worried about that at all, nor is California.

Mr. MATTHEW. Of course, that is not the point. There is saline content in the water now. The point is that the compact would be meaningless if the use of water up in the upper basin would render the water unfit for use in the lower basin.

Senator MILLIKIN. Would you not say it was a fair assumption—we are dealing here entirely with a theory that you have created that is not supported by the language of the compact—would you not say that it was a fair intention in the minds of those who made the compact that each State gets the water as it is when it gets it?

Mr. MATTHEW. Certainly the water is going to be used, and we are in favor of the development and use of the waters of the Colorado River system. Different types of development may result in different results, and I think from the standpoint of the interests of the entire basin the upper basin as well as the lower basin is interested in the development which will give the best benefits and the best results to all the water users in the basin.

Senator JACKSON. Did the compact not contemplate that as long as Colorado obtained its share of the 7½ million acre-feet, it could take it any place in the State of Colorado? It did not have to be all down in the lower area or a certain percentage allocated to the upper area. If any consideration were given to the quality, it seems to me that would have been spelled out.

Senator MILLIKIN. Every foot down the stream would have a claim to every foot above the stream for purer water. I cannot think of anything more impractical. I do not intend to spend a lot of time on this. I just ask you again, can you point to any provision in the compact on which you base this theory of a purer grade of water?

Mr. MATTHEW. I pointed out article VIII, Senator, which I think bears directly on the subject, and I think Mr. Ely might want to elaborate on this point when he speaks on the subject.

I will say one more thing. Senator Jackson is gone.

Senator JACKSON. I can be here if you are talking about purity.

Mr. MATTHEW. At the time the compact was negotiated it was stated by upper basin negotiators that there would never be over four hundred or four hundred fifty thousand acre-feet of transmountain diversion. Now, under the Bureau report on the Colorado River, which was issued 2 or 3 years ago, there is a potential diversion proposed in there of some 4 million acre-feet, which creates an entirely different picture.

Senator JACKSON. Yes, but is that not a moot question? It seems to me that as long as the State adheres to the compact, my offhand opinion would be it is not appropriate to determine whether there is a violation because there are discussions going on about various diversions of water and the amounts that might be diverted. Is that not a moot question?

Mr. MATTHEW. I think that it is a question that the upper basin is just as much interested in as the lower basin. There will be certain areas in the upper basin which might be affected by this point that I am bringing up also.

Senator MILLIKIN. Senator, there are discussions of bringing water from Washington down to California.

Senator JACKSON. We have heard about that.

Senator MILLIKIN. Because of those discussions, shall we assume that California does not want any water, and that therefore we in the upper States may take a larger share of water than provided in the compact? There are all kinds of studies going on. I understand this study is going on for the mechanical means of taking the salt of the Pacific.

Senator JACKSON. The Bureau claims, I think, that they have almost perfected that one and have spent quite a bit of money on it.

Senator MILLIKIN. I doubt that these discussions will provide an interpretation of the Colorado River Basin compact.

Mr. MATTHEW. May I say, Mr. Chairman, that there never have been any suggestions from California of taking water from Washington?

Senator MILLIKIN. How come you did not get around to that?

Mr. MATTHEW. We believe that we are taken care of pretty well with our resources, including the Colorado River.

Senator JACKSON. I think it should be said in all fairness I served many years on the House Interior Appropriations Subcommittee and I think you will recall that there was some talk about diverting the Klamath River to run it on into California. The Bureau did make some studies on that point. It is not entirely feasible. I assume there was no protest from California.

Do not misunderstand me, I am not taking after California. I did want to keep the record clear that the Bureau of Reclamation did spend several thousand dollars because I happen to be personally familiar with the problem.

Mr. MATTHEW. That is correct, but not under any suggestion by California.

Senator JACKSON. It was probably over the protest of California.

Mr. ELY. I think that is exactly correct. It was as wild a scheme as was ever hatched by bureaucracy in Washington, and that is saying quite a good deal.

Senator MILLIKIN. As long as California is represented by tremendously able men like Mr. Matthew and Mr. Ely, she does not need to worry that she will not get what she's entitled to.

Senator JACKSON. I concur in that.

Mr. MATTHEW. I might state also, Senator, that the Klamath River is just as much a California stream as an Oregon stream.

Senator JACKSON. I knew we would get to that. I am not here necessarily defending the honor of Oregon, but we do get pretty close to one another, Oregon and Washington, that is, and I think Oregon probably could take good care of that, too.

Mr. MATTHEW. I am happy to state the relations between Oregon and California are very cordial.

Senator JACKSON. And likewise with Washington.

Mr. MATTHEW. Yes, sir; they are.

Senator MILLIKIN. Have you finished, Mr. Matthew?

Mr. MATTHEW. Yes, sir. I wish to thank you on behalf of the Colorado River board for the opportunity of appearing in this matter.

Senator MILLIKIN. Thank you very much.

Mr. Ely?

## STATEMENT OF NORTHCUTT ELY, SPECIAL COUNSEL, COLORADO RIVER BOARD OF CALIFORNIA, WASHINGTON 5, D. C.

Mr. ELY. Mr. Chairman, six amendments are proposed to this bill. The first 4 are modeled on 4 amendments made, on the insistence of upper basin interests, to the bill which authorized the "second barrel" of the San Diego aqueduct (Public Law 171, 82d Cong., approved October 11, 1951), with necessary modifications. These subject the project to the compacts, statutes, and treaties which comprise part of the so-called law of the river. If such amendments were necessary for the San Diego bill, they are necessary for this bill, which authorizes a larger project and foreshadows even greater water uses. To these has been added a declaration that Congress, by enacting this bill, does not interpret these documents. This is necessary because the Department of the Interior project report, Senate Document 106, 82d Congress, which is incorporated by reference contains interpretations which are not agreed to by all the States of the Colorado River Basin.

The last two amendments:

Direct a survey by the Secretary of the Interior of the effect of transmountain diversions on the quality of water. California is concerned in this because article VIII of the Colorado River compact provides that "present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact" and the rights so protected necessarily involve quality as well as quantity of water. When the Colorado River compact was signed, Colorado's negotiator stated that transmountain diversions could never economically exceed 300,000 acre-feet per year. Now, 3 million acre-feet are proposed, including this small project.

Senator MILLIKIN. You say now 3 million acre-feet?

Mr. ELY. The Reclamation Bureau's report that Mr. Matthew referred to, on the development of the upper basin proposes an ultimate diversion of between 3 and 4 million acre-feet, not all from Colorado.

Senator MILLIKIN. That is not a matter that is before us now, is it?

Mr. ELY. No.

Senator MILLIKIN. That is something that might or might not happen.

Mr. ELY. That is correct, sir.

The last of these amendments disclaims any implication that the United States, by passing this bill, commits itself to any enlarged transmountain diversion. This disclaimer is in line with the Interior Department's own recommendation in its report, Senate Document 106, 82d Congress.

At this point, Mr. Chairman, may I place in the record a copy of the San Diego aqueduct bill, 65 Statutes 404? I have marked in the margin in red the four amendments made there to subject that project to the Colorado River compact and the law of the river.

I would like to have those portions underscored, if possible, in the transcript.

Senator MILLIKIN. It will be done.

(The document referred to (65 Stat. 404, Public Law 171, 82d Cong., ch. 494, 1st sess., H. R. 5102) is filed with the committee, and the underscored portions referred to by Mr. Ely are as follows:)

SEC. 2. The use of all water diverted through said works from the Colorado River shall be subject to and controlled by the Colorado River compact, the Boulder Canyon Project Act, the California Self-Limitation Statute and the Mexican Water Treaty and shall be included within and shall in no way increase the total quantity of water to the use of which the State of California is entitled and limited by said compact, statutes, and treaty.

SEC. 3. That the use of all water diverted through said works from the Colorado River shall be subject to and controlled by the Colorado River compact, the Boulder Canyon Project Act, the California Self-Limitation Statute and the Mexican Water Treaty and shall be included within and shall in no way increase the total quantity of water to the use of which the State of California is entitled and limited by the said compact, treaty, and statutes.

SEC. 5. The United States and the San Diego County Water Authority and their respective permittees, licensees, and contractees and all users and appropriators of water of the Colorado River diverted or delivered through the existing aqueduct and the enlargement or addition thereto shall observe and be subject to the Colorado River compact, the Boulder Canyon Project Act, the California Self-Limitation Statute and the Mexican Water Treaty in the diversion, delivery, and use of water of the Colorado River, anything in this act to the contrary notwithstanding, and such condition and covenant shall attach as a matter of law whether or not set out or referred to in the instrument evidencing such permit, license, or contract and shall be deemed to be for the benefit of and be available to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming and the users of water therein or thereunder by way of suit, defense, or otherwise in any ligitation respecting the waters of the Colorado River.

SEC. 8. This Act and all works constructed hereunder shall be subject to and controlled by the Colorado River Compact dated November 24, 1922, and proclaimed effective by the President June 25, 1929; the Boulder Canyon Project Act approved December 21, 1928; the California Limitation Act approved by the Governor of California March 4, 1929; and no right or claim of right to the use of the waters of the Colorado River shall be aided or prejudiced hereby.

Mr. ELY. May I also place in the record at this point the six amendments we are proposing?

The first amendment would appear on page 2 of S. 964, starting on line 3. It would delete down through the words "Treaty Series 994)" in line 7. At line 17 it would insert new material as follows:

The use of all water diverted through said works from the Colorado River shall be subject to and controlled by the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, and the Mexican Water Treaty (Treaty Series 994), and shall be included within and shall in no way increase the total quantity of water to the use of which the State of Colorado is entitled and limited by said compacts, statute, and treaty.

That language is taken almost verbatim, except for the necessary change of wording, from section 2 of the San Diego aqueduct bill

(65 Stat. 404), which is language added to that bill during its course in Congress.

The second amendment appears at page 3, line 4. Add a new section as follows:

No construction shall be undertaken under the authority of this Act and no funds shall be expended for the preparation of plans or specifications for any such construction unless and until the Secretary of the Interior has entered into a contract with the users of water therefrom which shall provide, among other things:

(1) that the use of all water diverted through said works from the Colorado River System shall be subject to and controlled by the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, and the Mexican Water Treaty (Treaty Series 994) and shall be included within and shall in no way increase the total quantity of water to the use of which the State of Colorado is entitled and limited by said compacts, statute, and treaty;

(2) that all of the waters of the Colorado River System exported from the natural basin of that system by means of works constructed hereunder, the extensions and enlargements of such works, to the drainage basin of the Arkansas River shall be consumptively used in the State of Colorado, and will not be made available by exchange, substitution, or use of return flow, or otherwise, for consumptive use in any State not a party to the Colorado River Compact.

The first paragraph, numbered (1) of that proposed amendment, is taken with suitable modifications from subparagraph 3 of section 3 of the San Diego aqueduct bill (65 Stat. 404).

The paragraph numbered (2) relates to protection against export of that water into a State not a party to the compact, as referred to by Mr. Matthew.

Our amendment No. 3 would appear at page 4, line 20. Insert a new section as follows:

The United States and the State of Colorado and their respective permittees, licensees, and contractees and all users and appropriators of water of the Colorado River System diverted or delivered through the works herein authorized and any enlargements or additions thereto shall observe and be subject to the Colorado River Compact, the Upper Colorado River Compact, the Boulder Canyon Project Act, and the Mexican Water Treaty (Treaty Series 994) in the diversion, delivery, and use of water of the Colorado River System, and such condition and covenant shall attach as a matter of law whether or not set out or referred to in the instrument evidencing such permit, license, or contract and shall be deemed to be for the benefit of and be available to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming and the users of water therein or thereunder by way of suit, defense, or otherwise in any litigation respecting the waters of the Colorado River System: *Provided*, That the Congress does not, by the enactment of this Act, construe or interpret any provision of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, or the Mexican Water Treaty, nor subject the United States to, nor approve nor disapprove, any interpretation of said compacts, statute, or treaty, anything in this act to the contrary notwithstanding.

The first portion of that amendment down to the word "provided" is taken from and modeled on section 5 of the San Diego aqueduct bill I previously referred to. The proviso added at the end is in our view essential to disclaim any intent of the Congress to construe any of these documents for the reason that Senate Document 106, the Bureau of Reclamations report, assumes at least the two interpretations of the Colorado River compact which, so long as they are restricted solely to operation in the upper basin, do not concern us, but if approved by the Congress as general interpretations of the Colorado River compact in this indirect fashion, would, we feel, be inequitable in the contest now prevailing in the United States Supreme

Court in *Arizona* v. *California et al.*, in which those same two principles of construction are involved.

There may be others. Those two are, first, the question of whether beneficial consumptive use shall be measured at the place of use by diversions less returns to the river, which is the manner in which consumptive use is defined in the Boulder Canyon Project Act, which binds us, as well as in the Mexican Water Treaty; or whether on the other hand, such uses shall be determined on the basis of manmade depletion measured at some distant point downstream, which is Arizona's theory in the pending case. This is also, for the time being, at least on a temporary basis, the method of computation set up in the upper Colorado River Basin compact.

A provision of the upper Colorado River Basin compact—article VI—provides that until the Commission, the governing body under that compact, determines otherwise, the manmade depletion theory shall be the basis of calculation.

We have no objection to the 4 States of the upper division or the 5 States of the upper basin, adding Arizona to that list, dividing the waters available to the upper basin, by whatever formula they please, but we do not wish to have any implications that that formula is the proper interpretation of the overriding Colorado River compact, and we wish Congress to disclaim any such intent.

Our fourth amendment would appear at page 5, line 4. It would add a new section as follows:

> This Act and all works constructed hereunder shall be subject to and controlled by the Colorado River Compact, proclaimed effective by the President June 25, 1929; the Boulder Canyon Project Act approved December 21, 1928; the Upper Colorado River Basin Compact, to which the Congress gave consent (Public Law 37, 81st Congress) April 6, 1949; and the Mexican Water Treaty (Treaty Series 994); and no right or claim of right to the use of the waters of the Colorado River system shall be aided or prejudiced hereby: *Provided*, That the Congress does not hereby interpret or construe said documents nor subject the United States to, nor approve nor disapprove, any interpretation or construction thereof.

That language, down to the word "provided," is taken from and modeled on section 8 of the San Diego aqueduct bill previously referred to, with these modifications.

The proviso is inserted for the same reasons that I have just explained with reference to our amendment No. 3.

Our amendment No. 5 would add a new section at page 5, line 4 of the bill before you as follows:

> The Secretary of the Interior is directed to institute studies and to make a report to the Congress and to the States of the Colorado River Basin of the effect upon the quality of water available at Lee Ferry, of all transmountain diversions of water of the Colorado River system proposed to be made in the upper Colorado River Basin, including those proposed to be made under the authority of this Act.

Mr. Matthew explained the background of that.

Our sixth and last amendment would be a new section added at page 5, line 4 as follows:

> Nothing in this Act, by implication or otherwise, shall commit the United States to the further exportation of water from the Colorado River system.

This is derived from similar language in the project planning report, Senate Document 106.

In conclusion, Mr. Chairman, may I say that California distinctly does not oppose this project. To the contrary, we are glad to see

development in the upper basin proceed within the terms of the Colorado River compact. By the same token, we feel it appropriate that the legislation which authorizes this or other upper basin projects should, first, contain therein the same safeguards that the upper basin interests have insisted be placed in the lower basin legislation, the San Diego aqueduct bill; and second, disclaim any intent to give congressional sanction to any interpretation of any of the documents comprising the law of the river. Whether that interpretation favored us or were against us, we feel Congress should disclaim any intent to make any interpretation.

Lastly, with respect to the "quality of water" question, we certainly do not ask that this project be delayed pending any investigation of the quality question, but we do feel that the time has come when the Department of the Interior should recognize the question of quality as well as quantity in its project planning. It is vital to all of us. This quality investigation should include the whole basin, not just the upper basin.

I think it is fair to say that in 1922, when the compact was negotiated, again in 1928 when the project act was enacted, in fact up until fairly recent years, this question of quality was largely overlooked by everybody. It is, however, the life and death of the basin as a whole. The Reclamation Bureau has assumed that the uses of the waters of the Colorado River system can be equated down to the point where there will be a variation of only a few hundred thousand acre-feet when the total quantity is put to use, that something like 17½ million acre-feet can be accurately measured and used. If that should happen when that time comes, the residue, the last million acre-feet of that, is going to be of a highly questionable quality, and the problem is what is its best use.

As you may recall, this question came up during the discussion of the Mexican Water Treaty. It was not resolved at that time. There has been testimony in connection with some of the projects before this committee to the effect that if the waters of the Colorado River system were so fully utilized the quality of water reaching the last of the California projects above the border would be so deteriorated that it would contain 3 to 4 tons of salt per acre-foot.

One of the witnesses for another State stated rather candidly that if that should happen, many of the lands in the Imperial Irrigation District, notwithstanding their very old water rights, would be driven out of cultivation.

Consequently, we think that article VIII of the Colorado River compact which provides in substance that present perfected rights shall remain unimpaired by this compact, means what it says: That it would be grossly inequitable for any contrary result to be reached.

We think it desirable to have the Government agencies start studying this question of quality many years before any of us face any such tragic possibilities, and that is the intent of the amendment proposed here directing such a study.

I thank you, Mr. Chairman, for your patience.

Senator MILLIKIN. Thank you, Mr. Ely, we are very glad to have had you.

Thank you, Mr. Matthew.

Mr. MATTHEW. I want to thank you, Senator Millikin, for your courtesy.

Senator MILLIKIN. We start at 3 o'clock this afternoon and wind up, I hope, not later than 6 o'clock.

The witnesses who are now unaccommodated are Mr. Patterson, Mr. Amend, and Mr. Will. Are there any other witnesses who want to be heard?

Mr. MCBROOM. Mr. McBroom of the Fish and Wildlife Service.

Senator MILLIKIN. If there is time this afternoon someone from Colorado might make any reply that they think should be made to what has been suggested here by these witnesses from California. If there is not time we ought to have a written statement on it. In any event if there is anything that you gentlemen wish to say in reply to anything that is put in by Colorado either orally or in writing, you will have the opportunity to do so.

Mr. ELY. Thank you for your usual courtesy, Mr. Chairman. We appreciate that.

(The following supplemental statement was subsequently received for the record:)

SUPPLEMENTAL WRITTEN STATEMENT OF NORTHCUTT ELY, SPECIAL COUNSEL, THE COLORADO RIVER BOARD OF CALIFORNIA

This statement is submitted by leave of the chairman, in response to the testimony of Jean S. Breitenstein, attorney for the Colorado Water Conservation Board, Denver, and John Geoffrey Will, secretary and general counsel, Upper Colorado River Commission.

In my testimony on June 16, 1953, I submitted six amendments to S. 964. the first four are modeled on those inserted at the insistence of Mr. Will and his associates, in the bill which authorized the construction of the second barrel of the San Diego aqueduct (act of October 11, 1951, 65 Stat. 604). They subject the project to the "law of the river," i. e., the Boulder Canyon Project Act, the Colorado River compact, the Mexican Water Treaty, and, in this case, the upper Colorado River Basin compact.

If these four amendments were necessary for the San Diego project, they are necessary for the Fryingpan project. The Fryingpan project would use about 50 percent more water than the second barrel of the San Diego aqueduct. Mr. Will's justification in his testimony on the Fryingpan project for the amendments he asked, and got, in the San Diego case is that there exists a schedule of priorities of California projects, approved by the State of California, and that San Diego has a low place on that schedule. That is no answer. Until the State of Colorado adopts a similar schedule of priorities, no one knows what relative priority the Fryingpan project will have. It may be relatively lower in Colorado's internal scale of priorities than San Diego's is in California's scale. We do know that there is a Colorado statute giving priority to west-slope uses against transmountain diversions like this one. It is no answer to say that the Fryingpan project would account for only 2 percent of Colorado's claims under the Colorado River compact. San Diego's equalled less than that proportion of California's minimum entitlement.

Nor is it any answer to say that the Fryingpan project is controlled by the Colorado River compact anyhow. So is San Diego. Moreover, the San Diego uses are controlled by the California Limitation Act, which is an agreement between the legislature of California and the Congress, and there is no such limitation act controlling the Fryingpan project.

Taking up our amendments in order:

No. 1, modeled on Mr. Will's amendment in section 2 of the San Diego Act, subjects all uses through the project works to the law of the river, and states that such uses will not increase Colorado's entitlement. If Mr. Will was right in San Diego's case, what possible objection can there be to the same safeguard in Colorado's case?

No. 2, modeled on Mr. Will's amendment in section 3 of the San Diego Act, requires that water delivery contracts contain two stipulations. The first stipulation subjects all uses to the law of the river, and, like Mr. Will's second amendment to the San Diego bill, provides that such uses will not increase the State's entitlement. What objection to this can come from the authors of this same language for San Diego?

The second contract stipulation proposed in our amendment No. 2 provides that the water taken by this project shall not be made available by exchange or otherwise for consumptive use in any State not a party to the Colorado River compact, e. g., Kansas or Arkansas. Mr. Breitenstein objects, and says that the Colorado River compact permits this very result, if the uses in Colorado are reasonable. We say the reverse. This is a serious point. The water supply of the Colorado River system is insufficient for the legitimate needs of the seven States of the Colorado River Basin. Its supply is not adequate to enable any of these States to gallop to the rescue of water shortages in other river basins. Forty percent of the water to be diverted by the Fryingpan project, it is estimated, will be return flow to the river, but to the Arkansas River, not the Colorado River. If the Gunnison project follows this one, with 900,000 acre-feet, and if Mr. Breitenstein is right, several hundred thousand acre-feet may lawfully escape the hard-pressed Colorado River Basin for the benefit of Kansas and Arkansas. If the ultimate transmountain diversions, amounting to nearly 4 million acre-feet, which have been surveyed by the Bureau of Reclamation should come into existence, the result, if Mr. Breitenstein is right, could bankrupt the Colorado River Basin and destroy the intended effect of the Colorado River compact. That compact described its purposes as "the expeditious agricultural and industrial development of the Colorado River Basin," etc. (art. I). The apportionment of the beneficial consumptive use of water which article III (a) of that compact made to the upper basin, was an allocation to that basin as it is defined in article II (f). This definition does not include Kansas or Arkansas. The Colorado River compact was accepted by the lower basin States on the representation that the total feasible transmountain diversions in the upper basin would be less than 300,000 acre-feet, and that Colorado's transmountain diversions would not exceed 5 percent of that State's entitlement.

Our amendment No. 3, down to the proviso, is simply a restatement of Mr. Will's language in section 5 of the San Diego Act. It directs that the United States, as well as the water users, be subject to the law of the river, and that this directive or covenant shall run with the land and be for the protection of the other States of the basin. Why not? If Mr. Will was right when he insisted on this provision being written into San Diego's use of less than 70,000 acre-feet per annum, it is right to include the same language in this bill, which authorizes the use of more than 90,000.

The proviso in our amendment No. 3 reads as follows:

"*Provided*, That the Congress does not, by the enactment of this Act, construe or interpret any provision of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, or the Mexican Water Treaty, nor subject the United States to, nor approve nor disapprove, any interpretation of said compacts, statute or treaty, anything in this Act to the contrary notwithstanding."

What is wrong with that? Mr. Breitenstein and Mr. Will should be its advocates. Or do the sponsors of this bill, a pilot-plant bill preceding the great transmountain diversion projects, believe that the measure does interpret these documents? Then the inference should be rejected. If they intend no such inference, how can they object to saying so? Actually, the bill does imply two interpretations of the compact, to which Mr. Breitenstein's testimony now adds a third. The first two interpretations are implied in section 1, by the bill's adoption, by reference, of the Reclamation Bureau's project report, Senate Document 106. This report interprets the Colorado River compact (wrongly, in California's view) so as to allow the measurement of beneficial consumptive use in terms of manmade depletion measured at a distant downstream point, instead of in terms of actual consumption measured at the place of use, as required by the Boulder Canyon Project Act and the Mexican Water Treaty. Article VI of the upper basin compact provides that the depletion method shall be used for the internal apportionment among the upper basin States—until the Commission decides otherwise—but this does not bind the lower basin States, and we want no inference that this is a proper interpretation of the Colorado River compact. This report, Senate Document 106, also interprets the Colorado River compact (again wrongly, in our opinion) to allow the measurement of use on a long-term average basis instead of an annual basis, e. g., to charge the Fryingpan project with the use of only 90,000 acre-feet in a year when it diverts 120,000, if in some other year it diverted only 60,000. These are among the questions now at issue in *Arizona* v. *California*, in the United States Supreme Court. Mr. Breitenstein is familiar with those issues through his work in that case. He now adds a third interpretation, viz, that the Colorado River compact allows Colorado to deliver to Kansas water which is diverted from the Colorado River watershed, without limitation except

that it be return flow from reasonable uses in Colorado. So much more the reason for a specific disclaimer of any such interpretations.

Our amendment No. 4, down to the proviso, follows Mr. Will's wording in section 8 of the San Diego Act, and so subjects the act, and all works constructed under it, to the Law of the River. Again, if the Upper Colorado River Basin Commission was right in demanding that amendment in the San Diego case, it belongs here, in this larger project. The proviso in our amendment No. 4 disclaims any interpretation of the documents to which the act is thus subjected. California does not seek any advantage from statutory interpretations of the documents involved in the dispute in *Arizona* v. *California*, but by the same token is entitled to protection against disadvantageous statutory interpretations. The bill before you does, by indirection, make such interpretations.

Our amendment No. 5 directs the Secretary of the Interior to make an investigation and report to the Congress and the States of the Colorado River Basin, of the effect upon the quality of water at Lee Ferry of the proposed upper basin transmountain diversions. Is anyone opposed to having those facts ascertained and published? Why? If the report shows no substantial impairment of quality, the upper-basin States should be glad to have that known. If the report does show substantial impairment of quality, then the Congress, as well as the States, should know the effect thereof on the great projects downstream in which the Government has invested hundreds of millions of dollars, as well as on the availability of water which is good enough to justify building the additional projects now proposed by Arizona and Nevada. We can argue about the relation of the Colorado River compact to quality of water when the facts are known. This amendment simply directs the Secretary to ascertain the facts. If they show, as witnesses have claimed in other hearings before this committee, that the quality of water in the lower basin will be so impaired by upper basin transmountain diversions as to make it impossible to maintain lower basin uses based upon water rights which long antedated the Colorado River compact, then article VIII of the compact prohibits that result, for it gives assurance that present perfected rights shall be unimpaired. Similarly, quality of water bears directly on the expansions of use desired by our neighbors. But first, let the facts be ascertained by the Secretary of the Interior.

Our amendment No. 6 states that nothing in this act, by implication or otherwise, commits the United States to the further exportation of water from the Colorado River Basin. Everyone agrees that this is so, and the project report (S. Doc. 106) says it ought to be so understood. There should be no objection to saying so, and it is not clear whether Mr. Breitenstein or Mr. Will actually offer any objection.

For the record, I am annexing extracts from California's answer in *Airzona* v. *California et al.* (No. 10 Original, United States Supreme Court, October 1952 term). These show, in more detail, the scope of the issues involving the Colorado River compact and the Boulder Canyon Project Act to which I have referred above. They are paragraphs 1–19, and 27–28, of the answer.

## EXHIBIT ACCOMPANYING SUPPLEMENTAL STATEMENT OF NORTHCUTT ELY, SPECIAL COUNSEL, COLORADO RIVER BOARD OF CALIFORNIA, JUNE 19, 1953

### EXTRACTS FROM ANSWER OF CALIFORNIA DEFENDANTS IN *ARIZONA* v. *CALIFORNIA, ET AL.*, UNITED STATES SUPREME COURT, NO. 10 ORIGINAL, OCTOBER TERM 1952

#### A. Historical and Geographical Background

##### 1. Introduction

The defendants in this action are the State of California and public agencies of this State authorized by its laws to serve water to their inhabitants and lands. The rights which the State and these agencies defend are their rights to the beneficial consumptive use of waters of the Colorado River system for projects already constructed and now operating. These projects represent more than 75 years of continuous development, the oldest dating from 1877, the newest from 1923.

More than 4 million inhabitants of the State of California use, and are dependent in whole, or in substantial part, upon the waters of the Colorado River System. The area within the defendant agencies served by these waters exceeds 2½ million acres. More than 60 California cities and other public entities are

served with water from the Colorado River system. To provide this service, the defendants have constructed, or have obligated themselves to pay the cost of, works costing more than $500 million. Within the area served by these works the value of property now exceeds $12 billion, and the gross value of the products of agriculture and industry in 1952 exceeded $3.5 billion. The economy of southern California is dependent upon the use of the waters here in controversy.

This controversy centers on the desire of Arizona to secure a right to the use of water for the central Arizona project, which has not been authorized by the Congress. She seeks to obtain water for that project by taking it from the existing and operating California projects. Further details as to the proposed Arizona project appear in paragraphs 65 and 66 of this answer.

This first affirmative defense is concerned with the rights of the defendants under contracts into which they entered with the United States, more than 20 years ago, for the delivery to them of water under the Boulder Canyon Project Act. It outlines (A) the projects dependent upon the waters to be delivered under these contracts, (B) the provisions of the Colorado River compact, (C) the provisions of the Boulder Canyon Project Act and (D) the provisions of the contracts themselves.

The second affirmative defense alleges the facts which estop Arizona from questioning the validity of these contracts; and third, the appropriative rights of the defendants; the fourth, the indispensability of the United States as a party to this action. The traverse to the complaint follows these affirmative defenses.

2. THE CALIFORNIA PROJECTS

The projects which carry the waters of the Colorado River system into southern California are three in number. From north to south they are as follows: (See plates 1 and 2 in the appendix to this answer).

(*a*) The Colorado River aqueduct, financed and constructed by defendant the Metropolitan Water District of Southern California, diverts from the main stream of the Colorado River above Parker Dam, 155 miles below Hoover Dam and 170 miles above the Mexican border. The main aqueduct transports water 242 miles westward and there connects with a system of about 300 miles of distribution aqueducts to serve the cities and other public bodies which are parts of the district. These cities now number 48, including defendants city of Los Angeles and city of San Diego. They extend 150 miles along the coastal plain of southern California and encompass a service area of over 1,500 square miles. The total direct investment in the Colorado River aqueduct system to date is over $244 million, and, when works now under construction are completed, will be in excess of $300 million. These sums are in addition to the Hoover Dam power obligations of this district and the city of Los Angeles. The district's minimum water requirements from the Colorado River are in the amount of 1,212,000 acre-feet per year, and this is the quantity provided for in its contracts with the United States. A full description of this project is contained in exhibit A to this answer and is incorporated herein by reference as though here fully stated. (See also plates 6A and 6B.)

(*b*) Defendant Palo Verde Irrigation District diverts water from the Colorado River at a point 212 miles below Hoover Dam and 113 miles above the Mexican border. It contains within its boundaries approximately 120,500 acres, including the lands of the Palo Verde Valley, the oldest irrigated area in the Colorado River Basin. Its people have spent more than $20 million to build the works that serve this area. A full description of this project is contained in exhibit B to this answer and is incorporated herein by reference as though here fully stated. (See also plate 3.)

(*c*) The All-American Canal diverts at Imperial Diversion Dam, 303 miles below Hoover Dam and 22 miles above the Mexican border. It transports water into the Imperial Valley for defendant Imperial Irrigation District and into Coachella Valley for defendant Coachella Valley County Water District, delivering water en route to the Yuma reclamation project, of which 25,000 acres are in California and 50,000 acres are in Arizona. The total California investment in this project is over $60 million. A full description of the All-American Canal project is contained in exhibit C to this answer and is incorporated herein by reference as though here fully stated. (See also plates 4 and 5.)

The minimum water requirements from the Colorado River system of the Palo Verde Irrigation District, Yuma project in California, Imperial Irrigation District and Coachella Valley County Water District, are 4,150,000 acre-feet per year, which is the quantity provided for by their contracts with the United States, and is within the quantities of their appropriations made a half-century and more ago.

3. BACKGROUND OF COLORADO RIVER COMPACT

(*a*) Prior to 1920 appropriators in California, and to a limited extent in Arizona, had appropriated and put to use all of the natural flow of the main stream of the Colorado River which existed in the late summer irrigating season. Uses by junior appropriators in Arizona, Colorado, Utah, New Mexico and Wyoming were interfering with the uses under the senior appropriations in California and Arizona. Satisfaction of such junior appropriations was dependent upon the construction of storage works to salvage the flood waters then wasting to the Gulf of California during the spring months of the year. These spring floodwaters were a menace to all of the lands along the lower river in Arizona and California. The menace was increasing because the deposition of silt by the river in its delta area was constantly raising the river bed, making the protection of the threatened areas by means of levees steadily more difficult and precarious. The geographical situation required the critical levees to protect Imperial Valley to be built and maintained in Mexico, and the main canal serving the Imperial Valley at that time followed a contour which carried it through Mexican territory en route. The construction of an All-American Canal was essential to the removal of international complications and problems, and was of concern to all the States in the Colorado River Basin and to the United States. Commencing in 1918, legislation was introduced in the successive Congresses to authorize the construction of such an All-American Canal. In the course of consideration of such legislation there became apparent the necessity for construction of storage works to control the floods, retain silt, and provide stored water for the expansion of junior appropriations. Such storage was desired by and was essential to all seven States of the Colorado River Basin. However, the States of the upper division (Colorado, Utah, New Mexico and Wyoming) were insistent that they be protected in some manner from the probability that after such storage was provided, appropriations in the lower basin would expand so rapidly as to appropriate all of the conserved waters and again forestall the possibility of long-range but slower expansion of uses in the upper basin.

(*b*) In 1921, the seven States of the Colorado River Basin enacted legislation authorizing negotiation of an interstate compact for the division of the waters of the Colorado River system, and the Congress, by the act of August 19, 1921 (42 Stat. 171), authorized the participation of a Federal representative therein. The negotiations so authorized were undertaken and were carried on at various times from January 26 to November 24, 1922, when the Colorado River compact, described in later paragraphs of this answer, was signed.

4. COMPARISON OF RIGHTS OF CALIFORNIA AND ARIZONA AT THE TIME OF SIGNATURE OF THE COLORADO RIVER COMPACT

(*a*) As of the date of signature of the Colorado River compact, November 24, 1922, complete irrigation distribution systems were in operation and providing service to Palo Verde Irrigation District, Imperial Irrigation District, and the portion of the Yuma project in California, for a total of approximately 610,000 acres, for which the demand on Colorado River water was not less than 4,500,000 acre-feet per annum. On a comparable basis such works had been completed and were in service along the Colorado River in Arizona for the Parker project, Yuma project, and other miscellaneous areas, for a total of 65,000 acres, for which the demand for water from the Colorado River was about 450,000 acre-feet per annum. In addition, works had been constructed in Arizona on the Gila River, a tributary of the Colorado River, requiring an additional 2 million acre-feet per annum.

(*b*) As of the same date, there were vested appropriative rights, valid under the laws of California, to the beneficial consumptive use of not less than 6 million acre-feet per annum of the waters of the Colorado River system, including those referred to in paragraph (*a*) above. The appropriative rights claimed by Arizona were alleged by that State in *Arizona* v. *California* (283 U. S. 423), to aggregate 3,900,000 acre-feet per annum, of which a quantity of approximately 3 million acre-feet per annum was alleged to relate to the waters of the Gila River and its tributaries.

## B. The Colorado River Compact

5. SIGNATURE OF TEXT OF COMPACT

On November 24 1922 representatives of the States of Arizona California Nevada Utah Colorado New Mexico and Wyoming signed the text of a proposed compact (appendix 1 to this answer) to become effective upon ratification by their legislatures and consent of the Congress. This compact became effective as the

six-state Colorado River compact June 25, 1929, in the manner hereinafter described Arizona having rejected and refused to ratify it. Wherever in this answer the effect of the six-state Colorado River compact is pleaded such effort is that which was reported by the negotiators in their published reports to their legislatures and to the Congress and which appears in the legislative history of the Boulder Canyon Project Act which granted congressional consent thereto in modified form.

6. TEXT OF COMPACT: ARTICLE I: PURPOSES

Article I of said compact states its major purposes to be for the equitable division and apportionment of the use of the waters of the Colorado River System to establish the relative importance of different beneficial uses of water; to promote interstate comity; to remove causes of present and future controversies; and to secure the expeditious agricultural and industrial development of the Colorado River Basin the storage of its waters and the protection of life and property from floods. Article I further provides that to these ends the Colorado River Basin is divided into two basins and an apportionment of the use of part of the water of the Colorado River System is made to each of them with the provision that further equitable apportionments may be made.

7. ARTICLE II: DEFINITIONS

Article II (a) of said compact defines the term "Colorado River System" to mean that portion of the Colorado River and its tributaries within the United States of America. Defendants allege: said definition includes as a necessary part of the Colorado River System, the Gila River and its tributaries. The Gila River rises in New Mexico and flows across Arizona to join the main stream of the Colorado River near Yuma, Ariz.

Article II (b) of said compact defines the term "Colorado River Basin" to mean all of the drainage area of the Colorado River system and all other territory within the United States of America to which the waters of the Colorado River system shall be beneficially applied. Defendants allege: as so defined, the Colorado River Basin includes all of the areas in the State of California served by the defendants.

Article II (c) of said compact defines the term "States of the upper division" to mean the States of Colorado, New Mexico, Utah, and Wyoming.

Article II (d) of said compact defines the term "States of the lower division" to mean the States of Arizona, California, and Nevada.

Article II (e) of said compact defines the term "Lee Ferry" to mean a point in the main stream of the Colorado River 1 mile below the mouth of the Paria River.

Article II (f) of said compact defines the term "upper basin" to mean those parts of the States of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters naturally drain into the Colorado River system above Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the system above Lee Ferry. Defendants allege that the term "upper basin" as so defined is not identical with the term "States of the upper division" as defined in article II (c), but includes a portion of Arizona, which is not a State of the upper division.

Article II (g) of said compact defines the term "lower basin" to mean those parts of the States of Arizona, California, Nevada, New Mexico, and Utah within and from which waters naturally drain into the Colorado River system below Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the system below Lee Ferry. Defendants allege that as so defined, the lower basin includes all of the areas in the State of California served by the defendants, and all of the drainage area of the Gila River and its tributaries in Arizona. The term "lower basin" as so defined is not identical with the term "States of the lower division" as defined in article II (d), but includes portions of Utah and New Mexico, which are not States of the lower division.

8. ARTICLE III (A): APPORTIONMENTS

Article III (a) of said compact apportions from the Colorado River system in perpetuity to the upper basin and to the lower basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which it states "shall include all water necessary for the supply of any rights which may now exist." Defendants allege: the apportionment in perpetuity effected by article III (a) of the Colorado River compact is intended to and does reserve the

use of the quantities therein stated from the operation of the laws of appropriation as between the upper basin and the lower basin. Said apportionment is from the waters of the entire Colorado River system, including the Gila River and its tributaries, and not merely from the virgin flow of the main stream.

The term "consumptive use" is not defined in said compact, but is defined as "diversions less returns to the river" in section 4 (a) of the Boulder Canyon Project Act (act of December 21, 1928, 45 Stat. 1057), which statute granted the consent of the Congress to said compact.

The foregoing definition of "consumptive use" was again employed in the Mexican Water Treaty signed February 3, 1944 (treaty series 994), as follows:

Article I (d): " 'To divert' means the deliberate act of taking water from any channel in order to convey it elsewhere for storage, or to utilize it for domestic, agricultural, stockraising or industrial purposes whether this be done by means of dams across the channel, partition weirs, lateral intakes, pumps or any other methods."

Article I (h): " 'Return flow' means that portion of diverted water that eventually finds its way back to the source from which it was diverted."

Article I (j): " 'Consumptive use' means the use of water by evaporation, plant transpiration or other manner whereby the water is consumed and does not return to its source of supply. In general it is measured by the amount of water diverted less the part thereof which returns to the stream."

Such was the commonly accepted meaning of the term at the time of negotiation of the compact and of the congressional consent thereto, and was and is the meaning of said term as used throughout said compact. Beneficial consumptive uses in California and in Arizona were and are intended and required by the compact to be measured in the identical manner and at the places of use, wherever they occur, not in terms of "manmade depletion" of the flow of only the main stream at some lower point. No beneficial consumptive uses at places of use are excepted or exempt from said method of measurement, whether of natural flow or of water salvaged by storage or otherwise in any part of the basin. The words "per annum" as used in said compact mean "each year" and not an average of such uses over a period of years.

Uses of the waters of the Gila River and its tributaries under rights which existed as of June 25, 1929, are chargeable first against the apportionment made to the lower basin by article III (a) of the compact. Such uses in Arizona as of that date aggregated not less than 2 million acre-feet per annum.

### 9. ARTICLE III (B): PERMISSION TO THE LOWER BASIN TO INCREASE ITS USES

Article III (b) of said compact provides that, in addition to the apportionment made in paragraph (a) of article III, the lower basin is given the right to increase its beneficial consumptive use of the waters of the Colorado River system by 1 million acre-feet per annum. Defendants allege: The terms "beneficial consumptive use" and "per annum" as used in article III (b) have the same meaning as in article III (a). The first million acre-feet of beneficial consumptive uses above 7,500,000 acre-feet per annum, wherever such uses in the lower basin may occur, are encompassed by article III (b), and said article III (b) does not relate solely to waters found flowing in the Gila River or any other specific portion of the lower basin.

Said compact contains no provision apportioning the use of water as between Arizona and California or among any States; imposes no restriction or limitation upon the amount which any State may use of the waters apportioned by article III (a) to the basin in which such use is made; and imposes no restriction or limitation upon Arizona, California, Nevada, Utah, or New Mexico with respect to their respective participations in the increase of beneficial consumptive use permitted to the lower basin by article III (b) of said compact.

### 10. ARTICLE III (C): MEXICO

Article III (c) of said compact provides that if, as a matter of international comity, the United States of America shall recognize in the United Mexican States any right to the use of any waters of the Colorado River system, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b) of said article III, and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the States of the upper division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d), hereinafter referred to. Defendants allege: Neither

in said article III (c) nor in any other provision of the Colorado River compact is water or the use of water apportioned to the United Mexican States. The obligation assumed in article III (c) by the States of Colorado, New Mexico, Utah, and Wyoming, being the States of the upper division, to deliver water to supply one-half of the Mexican deficiency, does not include any obligation on the part of Arizona, with respect to that portion of her territory which is in the upper basin, to make such delivery. In the event that a deficiency must be borne by the lower basin under article III (c), the lower basin is not required to diminish the uses apportioned to it by article III (a) unless the additional uses permitted it by article III (b) shall have been first yielded and shall have proved insufficient to meet the lower basin's share of the treaty requirement.

On April 18, 1945, the Senate of the United States consented, with reservations, to a treaty (treaty series 994) with the United Mexican States, and the same was ratified, effective as of November 8, 1945. Defendants allege that the performance of said treaty as to the Colorado River system will require the guaranteed delivery, from any and all sources, of 1,500,000 acre-feet of water per annum at the Mexican boundary, and that said sources are the entire Colorado River system, including the Gila River and its tributaries.

11. ARTICLE III (D): GUARANTY BY STATES OF THE UPPER DIVISION

Article III (d) of said compact provides that the States of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of said compact. Defendants allege: the quantity of 75 million acre-feet specified in article III (d) bears no quantitative relationship to the beneficial consumptive use of 7,500,000 acre-feet per annum apportioned to either the upper basin or lower basin by article III (a).

12. ARTICLE III (E): REASONABLE USE

Article III (e) of said compact provides that the States of the upper division shall not withhold water, and the States of the lower division shall not require the delivery of water, which cannot reasonably be applied to domestic and agricultural uses.

13. ARTICLE III (F,G): FURTHER APPORTIONMENT

Article III (f) of said compact provides that further equitable apportionment of the beneficial uses of the waters of the Colorado River system unapportioned by paragraphs III (a), (b), and (c) may be made in the manner provided in paragraph (g) at any time after October 1, 1963, if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b) of article III.

Defendants allege: the provisions of articles III (f) and III (g) are permissive and not mandatory, and no State has committed itself to enter into such a future compact.

The "further apportionment" referred to in article III (f) relates only to an apportionment between basins and then only on mutual consent of all States in both basins.

Neither article III (f) nor any other article of the Colorado River compact prohibits or prevents the United States from presently contracting for the delivery from storage of, or the defendants herein from receiving, appropriating or using, waters surplus to those required to sustain the uses apportioned by article III (a), nor does it postpone the enjoyment of the use thereof until another interstate compact is made, some time after October 1, 1963, if such a compact is ever made.

Article III (f) postpones the right of either basin to demand the negotiation of such a compact until after (1) October 1, 1963, and (2) beneficial consumptive uses in the upper basin exceed 7,500,000 acre-feet per annum or such uses in the lower basin exceed 8,500,000 acre-feet per annum.

Article III (g) provides the mechanics for the calling of a conference and the formulation of a compact for a further apportionment as referred to in article III (f), subject to legislative ratification thereof by the signatory States and consent by the Congress.

14. ARTICLE VII: INDIAN TRIBES

Article VII provides that nothing in the Colorado River compact shall be construed as affecting the obligations of the United States of America to Indian tribes. Defendants allege: all beneficial consumptive uses of water by Indian

tribes pursuant to obligations of the United States to such tribes are chargeable to the beneficial consumptive uses available under the compact to the basin, and to the State, in which such uses are situate.

15. ARTICLE VIII: PRESENT PERFECTED RIGHTS

Article VIII of said compact provides that "present perfected rights" to the beneficial use of waters of the Colorado River system are unimpaired by this compact. Said article VIII provides further that whenever storage capacity of 5 million acre-feet shall have been provided on the main Colorado River within or for the benefit of the lower basin, then claims of such rights, if any, by appropriators or users of water in the lower basin against appropriators or users of water in the upper basin shall attach to, and be satisfied from, water that may be stored not in conflict with article III. Said article VIII further provides that all other rights to beneficial use of waters of the Colorado River system shall be satisfied solely from the water apportioned to that basin in which they are situate.

Defendants allege: "Unimpaired" as used in this article means unimpaired as to both the quantity and the quality of the waters to which said perfected rights relate. The compact does not define the term "present perfected rights." The rights existing in the defendants on and prior to June 25, 1929, are alleged in paragraph 28 of this answer.

16. ARTICLE XI: RATIFICATION

Article XI of the compact provides that said compact shall be binding and obligatory when it shall have been approved by the legislatures of each of the signatory States and by the Congress of the United States.

17. RATIFICATION OF 7-STATE COMPACT BY 6 STATES: 1923

During the year 1923, the legislatures of California, Colorado, Nevada, New Mexico, Utah, and Wyoming ratified the proposed Colorado River compact. The legislature of Arizona rejected it, after first adopting in one house or the other reservations or amendments which, among others, would have provided "That the Gila River System, including the waters of said Gila River and streams tributary thereto, be not included, considered or involved in any way with the so-called Colorado River compact."

18. REJECTION BY ARIZONA: 1925

In 1925 the Governor of Arizona formally announced that Arizona elected to rely on the law of appropriation as between States as announced by this Court in *Wyoming* v. *Colorado* (259 U. S. 419 (1922)), and that Arizona did reject the proposed Colorado River compact.

19. RATIFICATION OF SIX-STATE COMPACT: 1925–29

Between 1925 and 1929, the Legislatures of California, Colorado, Nevada, New Mexico, Utah and Wyoming enacted legislation reciprocally waiving the provisions of article XI of the proposed Colorado River compact (which article made the compact effective when approved by the legislatures of 7 States), and enacting that said compact should become effective when 6 States should have ratified it and the Congress should have given its consent.

25. PROCLAMATION OF SIX-STATE COMPACT BY PRESIDENT

On June 25, 1929, the President of the United States proclaimed that (a) 7 States had not ratified the Colorado River compact within 6 months from the date of the approval of the Boulder Canyon Project Act, but that (b) 6 States (including California) had ratified said compact and consented to waive the provisions of article XI thereof requiring 7-State approval, as prescribed in section 13 (a) of the Boulder Canyon Project Act; (c) that California had met the requirements set out in the first paragraph of section 4 (a) of the Boulder Canyon Project Act necessary to render said act effective on 6-State approval of said compact, and (d) all prescribed conditions having been fulfilled, the Boulder Canyon Project Act was effective June 25, 1929 (appendix 4 to this answer, 46 Stat. 3000).

26. LEGISLATION BY ARIZONA AS TO COMPACT

On February 24, 1944, the Legislature of Arizona enacted a statute entitled "An Act ratifying the Colorado River compact; and declaring an emergency." (Sess. L. Ariz. 144, pp. 427–428.) The effect of said statute is referred to in paragraph 59 of the traverse in this answer.

27. STATUTORY COMPACT

(*a*) The Boulder Canyon Project Act offered to California, and California by its Limitation Act accepted, a statutory compact between the United States and California, on the basis of the interpretations of the Colorado River compact, the Boulder Canyon Project Act, and the proposed statutory compact appearing in the legislative history of the Boulder Canyon Project Act; and said statutory compact is now in existence, subject to the terms of the six-State Colorado River compact.

(*b*) Arizona has acquiesced in and does by the present action acquiesce in the existence of said statutory compact.

(*c*) Said statutory compact authorizes the United States to contract to deliver, and to presently deliver, water from storage to users in California up to the full quantities stated in said statutory compact.

(*d*) Said quantities comprise the aggregate annual beneficial consumptive use of not to exceed:

(1) Four million four hundred thousand acre-feet of the waters apportioned to the lower basin by article III (a) of the Colorado River compact, plus

(2) One-half of all excess or surplus waters not apportioned by article III (a) of the Colorado River compact, including in said excess or surplus the waters referred to in article III (b) of said compact.

(*e*) The waters so delivered by the United States are for permanent service and available, among other purposes, for the supply of any rights which existed in California as of June 25, 1929.

(*f*) Said statutory compact does not provide for the reduction of said quantities in consequence of reservoir evaporation or other losses occurring prior to delivery of said waters at the points of diversion in California.

(*g*) Said statutory compact authorizes California and users therein to presently contract with the United States for the delivery to such users of water stored by the United States, and to receive, appropriate, and presently use the same.

(*h*) Neither the Colorado River compact nor said statutory compact withdraws said excess or surplus waters from present appropriation or use in California, nor prohibits nor prevents the United States from lawfully contracting to deliver, and presently delivering, such excess or surplus waters for present use in California and for permanent service.

(*i*) California was induced to enact the Limitation Act and thereby accept the offer of a statutory compact made by the United States in the Boulder Canyon Project Act by the representation of the United States, known to Arizona, that the said offer and proposed compact had the meaning and intent above alleged.

(*j*) California has fully performed all obligations of said statutory compact on its part to be performed to date, and is entitled to the performance of said statutory compact by the United States.

28. RIGHTS OF CALIFORNIA AS OF JUNE 29, 1929

(*a*) As of June 25, 1929, the effective date of the Colorado River compact, the Boulder Canyon Project Act, and the statutory compact, projects had been constructed and were in operation in California requiring the beneficial consumptive use of more than 4,950,000 acre-feet per annum of the waters of the Colorado River System. Rights to the use of that quantity were part of then vested appropriative rights of the defendants valid under the laws of California, to the beneficial consumptive use of a quantity greatly in excess of 5,362,000 acre-feet per annum of waters of the Colorado River System.

(*b*) In addition to the projects of the defendants in this action there are large areas in California readily susceptible of irrigation from the Colorado River System by means of feasible projects for which valid appropriations had been made under the laws of California long prior to the enactment of the Boulder Canyon Project Act. In consequence however, of the limitation imposed upon California's uses by the said statutory compact, California's valid appropriations, which aggregated in excess of 8 million acre-feet per annum as of June 25, 1929, were restricted by the formula stated in said statutory compact to a basis adequate only to supply the amounts required by the Palo Verde project, the Colorado River

aqueduct, and the All-American Canal as constructed. The minimum amounts required by these projects for beneficial consumptive use aggregate 5,362,000 acre-feet per annum.

(c) As of June 25, 1929, the comparable statistics relative to Arizona did not differ materially from those alleged in paragraph 4 of this answer with reference to the date November 24, 1922.

(Whereupon, at 12:45 p. m., June 16, 1953, the hearing was adjourned until 3 p. m. the same day.)

AFTERNOON SESSION

Senator MILLIKIN. The meeting will come to order.

Mr. Breitenstein?

## STATEMENT OF JEAN S. BREITENSTEIN, ATTORNEY-AT-LAW, DENVER, COLO., REPRESENTING COLORADO WATER CONSERVATION BOARD, DENVER, COLO.—Resumed

Mr. BREITENSTEIN. When the hearing recessed this morning, witnesses for California had presented certain amendments which they wish to suggest to the bill. If I may, I would like to briefly comment on those amendments.

Senator MILLIKIN. Please proceed.

Mr. BREITENSTEIN. The witnesses stated that their first four amendments were predicated on certain amendments to the bill to authorize the so-called second barrel of the San Diego aqueduct. The differences between the situation involving the second barrel of the San Diego aqueduct, and the project which is now before the committee, will be explained by Mr. Will, who will testify this afternoon before the committee. In addition to what he has to say, there are 2 or 3 matters which I wish to direct the attention of the committee to.

The primary purpose of amendments 1, 2, 3, and 4 seem to be to assure that there will be compliance with the various documents which constitute the law of the Colorado River. To that extent we have no quarrel with the State of California at all, but we wish to point out that the matter in our opinion is taken care of.

I direct your attention to the fact that paragraph 15 of the operating principles which I discussed this morning contain a provision that the project, its operation, maintenance, and use shall be subject to the provisions of the upper Colorado River Basin compact, the Colorado River compact, and the Boulder Canyon project. It is the intent of those who are sponsoring the project here to make its construction and operation subject to those documents which constitute the law of the Colorado River.

So far as amendment No. 2 is concerned, there is an additional factor added which does not pertain to the amendments to the second barrel of the San Diego project. That is their paragraph No. 2, which requires that all of the waters exported from the natural basin of the Colorado River be consumptively used within the State of Colorado.

In the discussion of that principle this morning, Mr. Raymond Matthews made reference to a statement which he attributed to Clifford H. Stone, the director of the Colorado Water Conservation Board until the time of his death. In that regard, I would like to point out that I, as the attorney for the board, presented certain

comments by memorandum dated July 31, 1952. Pursuant to request made by Judge Stone in letters dated May 22, 1952, and July 15, 1952, in which he specifically referred to comments of the Colorado River Board of California, pertaining to this subject which was mentioned in this requested amendment, he asked my opinion as the attorney for the water conservation board on that point.

If I may, I would like to read into the record my conclusions on that phase of the controversy. My memorandum is quite long, and there is no necessity for putting the whole thing in. My conclusions were these:

(*a*) The transmountain diversion of water from the natural basin of the Colorado River is proper under the Colorado River Compact of 1922, and under Colorado law.

(*b*) Water so diverted from one basin to another must be used for a beneficial purpose and if used for domestic or agricultural purposes which result in return flows of such waters to the stream basin into which the diversion is made, and such return flows augment the quantity of water flowing to a downstream State which is not a Colorado River Basin State, there is no violation of the compact provided such domestic and agricultural uses are reasonable and not wasteful.

Of course, that is the contemplation of this project.

(*c*) If water diverted across the mountains from the natural basin of the Colorado River is used solely for the generation of hydroelectric power, and if such water enters an interstate stream and augments its flows to a State which is not a Colorado River Basin State, such use is a violation of the compact if the water so used is currently needed in the State of the lower diversion for domestic and agricultural purposes.

Of course, that does not apply here, because it contemplates it will be used for agricultural and municipal purposes. There is one other matter involved in this subject which is pointed up by the amendments.

Senator MILLIKIN. May I not ask you this question: The water which California gets out of the Colorado, does that not enter into another basin entirely?

Mr. BREITENSTEIN. Well, there are two aspects of that. First, so far as the municipal uses in the southern Colorado area are concerned, the water is not entirely consumed and is wasted into the Pacific Ocean.

Senator MILLIKIN. Southern California?

Mr. BREITENSTEIN. Southern California, yes. And as far as the uses in the Imperial District are concerned, there are very substantial wastes in the Salton Sea. In the suggested amendments, number 3 and 4, there have been added to the language of the San Diego aqueduct bill, in addition to certain changes which were necessary, a proviso. The provisos on the two are of the same general effect. I am reading now from amendment No. 4. The proviso is that the Congress does not hereby interpret or construe said documents nor subject the United States to, nor approve or disapprove, any interpretation or construction thereof.

My first comment on that is that that is inconsistent with their suggestion about the consumptive use of the water within the State of Colorado, because if the Congress adopted that, they would be construing and interpreting the contract.

So they are asking first that there be an interpretation of the contract and then saying that by this act there shall be no interpretation. It seems to me those are somewhat inconsistent.

I would like also to point out this: All the witnesses who have appeared before the committee, as I understand their testimony, including those of California, have conceded that the water which will be taken from the Colorado River system is within the quantity of water to which Colorado is entitled. To that extent, that constitutes an interpretation by every one of the various documents which constitute the law of the river. So it is not entirely accurate to say that the authorization of the bill would not be an interpretation or construction of the compact because everyone has conceded that the water is within that to which Colorado is entitled.

So to that extent at least is not consistent of the parties here.

On one matter I may say that I am generally in agreement with what Mr. Ely said. It is not the intent in requesting the authorization of this compact to in any way affect a pending lawsuit. He referred particularly to the Arizona against California case. That is not the intent of any of the sponsors of this project. The bill and the operating principles and the report thereon do not go into the question of the measurement of beneficial consumptive use. The effect of the provision of the upper basin content on measurement of beneficial use was gone into quite thoroughly with California witnesses and Colorado witnesses at the time of the approval of the upper Colorado River Basin compact, and so far as I can see, there is no issue on that here, and there is no intent to affect an existing lawsuit.

Senator MILLIKIN. We do not need to make an interpretation of that for the purpose of this project.

Mr. BREITENSTEIN. No, sir; it is not necessary at all, Senator.

Senator MILLIKIN. And we do not intend to do so.

Mr. BREITENSTEIN. Yes.

Next, on amendment No. 5, that is the one which refers to the quality of water. That matter was gone into this morning, and again I pointed out that if amendment No. 5 were adopted, that would constitute an interpretation or construction of the compact which California itself says that it does not wish. So we feel that is improper.

The last amendment is that there is no implication or otherwise that the United States is committed to further exportation of water from the Colorado River system. Of course, that is inherent in the action of the Colorado Water Conservation Board, Senator, and action by that board on this project and by the committee and the Congress on this project does not constitute any commitment whatsoever to further exportations. They will be considered on their own merit at the time they arise.

Those are all the comments which I have.

Senator MILLIKIN. Thank you very much, Mr. Breitenstein.

Mr. Will?

## STATEMENT OF JOHN GEOFFREY WILL, SECRETARY AND GENERAL COUNSEL, UPPER COLORADO RIVER COMMISSION

Mr. WILL. Mr. Chairman, perhaps it would be best if I should read the very brief statement that I have prepared to present to the committee on this occasion.

My name is John Geoffrey Will. I am secretary and general counsel of the Upper Colorado River Commission, the headquarters of which are located at Grand Junction, Colo.

The Upper Colorado River Commission is an interstate body, created under and by virtue of the upper Colorado River Basin compact, entered into in October of 1948 by the States of Arizona, Colorado, New Mexico, Utah, and Wyoming, ratified by their respective legislatures and duly consented to by the Congress.

One of the principal purposes of the upper Colorado River Basin compact and, consequently, one of the principal objectives of the Upper Colorado River Commission, is to secure the expeditious agricultural and industrial development of the upper Colorado River Basin States. To that end, the commission seeks the authorization of a project known as the Colorado River storage project and participating projects, with respect to which bills have been introduced, Senator, by yourself and the Senators from the other upper basin States, as well as by Senator Johnson.

The interests of the commission are, however, not by any means confined to the authorization of that one project. In line with the objectives stated a moment ago, the commission supports the authorization of all worthy projects looking to the development of the agricultural and industrial resources of the upper Colorado River Basin States. Furthermore, the commission supports the authorization of sound Federal reclamation projects throughout the 17 Western States. Thus it is that the commission has supported the authorization of the central Arizona project, in Arizona, the second barrel of the San Diego aqueduct, in California, and the Collbran project in Colorado. I am glad of this opportunity to testify in behalf of the authorization of the Fryingpan-Arkansas project, Colorado.

Expert witnesses who have already appeared before this committee have discussed, or will discuss the physical, engineering, economic and legal aspects of the Fryingpan-Arkansas project. It is not my purpose to discuss these aspects of the project. Nor would it be appropriate for me to do so, since I cannot qualify as an expert with respect to them. I can and do testify, however, as a lay witness, to my understanding of the urgent needs for water in the Arkansas Valley of Colorado that have prompted the investigations of the possibilities lying in the importation of water from the Colorado River system and the subsequent production of a project report.

Quite aside from the agricultural aspects of this project, and these aspects are important, the Fryingpan-Arkansas project will constitute the means whereby the great city of Pueblo, Colo., and a number of towns and communities in the Arkansas Valley will achieve supplemental municipal water supplies. I can and I do, as a lay witness, testify to my understanding regarding the desperate need that exists for such additional municipal water.

Senator MILLIKIN. Have we had a statement of the population of Pueblo in this hearing?

Mr. BEISE. I have it here, Senator.

Mr. WILL. The water requirements of the Fryingpan-Arkansas project are well within Colorado's share of the consumptive use of the waters of the Colorado River system under the terms of the upper Colorado River Basin compact of 1948. I am informed that the project will pay out in accordance with general policies laid down

by the Federal reclamation laws. I hope, therefore, that this committee will give the Fryingpan-Arkansas project favorable consideration.

Mr. Chairman, Mr. Breitenstein just testified that I would have something to say on the subject of the circumstances surrounding a number of amendments that were suggested by the late Charles A. Carson of Arizona, and I, before the House Armed Services Committee and before the Senate Armed Services Committee in connection with the bill to authorize the second barrel of the San Diego aqueduct. I would like to, if I may, just touch on that very briefly.

The circumstances as we viewed them were these, and they are very different, as you will note, Mr. Chairman, from the circumstances surrounding the authorization of the Fryingpan-Arkansas project.

Senator MILLIKIN. Before you go into that, has your organization specifically authorized your endorsement?

Mr. WILL. No, sir; it has not. I am acting within general directives of the upper Colorado commission.

Senator MILLIKIN. Is there any objection that you do so?

Mr. WILL. None indeed. I might even go further than I did in my statement of a moment ago, in which I said I was acting within general directives of the commission. It is a fact that following representations before the commission on the part of the State of Colorado, the commission did adopt a resolution, a certified copy of which I do not, unfortunately, have with me to this general effect: That the commission having considered these various proposed developments in the State of Colorado adopted the policy that it would support such as had received the support of the Colorado Water Conservation Board.

And now, if I may, Mr. Chairman, turning back to these circumstances in connection with which it seemed to Mr. Carson and myself and to the upper Colorado River commission that certain amendments to the bill to authorize the second barrel of the San Diego aqueduct should be offered, in our estimation there was a possibility that unless these particular amendments, with respect to which we reached agreement with Congressman MacKinnon of that area, were adopted there might some day be determined to have occurred a practical construction of the law of the river that would be contrary to the interests not only of the upper basin States but possibly of one or another lower basin State as well.

The circumstances were these: As you well remember, Senator, there is in existence in the State of California a priority agreement, under which the several agencies that are parties to that agreement have priorities in order to the use of waters to which California is entitled. San Diego's priority is low in the general scheme. The time might well arrive when, owing to development in the upper Colorado River Basin, the surplus waters then readily available to fulfill the needs of the second barrel of the San Diego aqueduct would no longer be available. And yet if a bill to authorize that second barrel were passed without such amendments as we were suggesting, we felt that that practical construction might be held to have occurred. We supported the authorization of the second barrel before the House and Senate Armed Service Committees, and we said that there will be water available as a practical matter, in our judgment, for many years. But we said in order to avoid the possi-

bility of that construction to which I have referred we would like to have these particular amendments incorporated in the bill. They were readily agreed to by Congressman MacKinnon. There was no objection to them, so far as I know, that was ever raised.

I may, Mr. Chairman, if it is permissible, be permitted to read a part of my statement on the occasion before the House committee. I said:

H. R. 5102—

referring to the House bill then pending before the committee—

however, goes far toward meeting those objections to which preceding bills gave rise. I congratulate Congressman MacKinnon on the inclusion in H. R. 5102 of section 6 which provides, in effect, that all works constructed thereunder shall be subject to and controlled by the Colorado River compact, the Boulder Canyon project and the California limitation act, and that no right or claim of right to the use of the waters of the Colorado River shall be aided or prejudiced thereby.

You will note there, Mr. Chairman, that I have referred to amendments that are analogous to the amendments presented by Mr. Ely this morning, or to some of them.

Continuing my statement, I said:

Some such assurance is needed—

and here is another circumstance, Mr. Chairman, that I most respectfully put some emphasis on that does not exist in the case of the Fryingpan-Arkansas project. I said:

Some such assurance is needed in the light of the statement contained in the 1948 report of the San Diego County Water Authority on the "need and feasibility of increasing the capacity of the San Diego aqueduct."

Here is what that statement contained in this particular connection:

In the meanwhile the Metropolitan Water District water rights can either be strengthened by a policy of diverting and using increasing amounts of Colorado River water in communities where the need exists or such rights may be weakened by pursuing a policy of restricting further use of Colorado River water until the decision of the Supreme Court has been received.

You see, then, Mr. Chairman, that in addition to what I spoke of as the other particular circumstances that caused us to believe in our best judgment that those amendments should be offered, there was that further statement in the report of the Metropolitan Water District of Southern California.

Now, Mr. Chairman, I would like the record to show that I adopt Mr. Breitenstein's comments on Mr. Mathews' statement, and his comments on these other amendments that were offered this morning by Mr. Ely.

Senator MILLIKIN. Thank you, Mr. Will.

Mr. Patterson?

## STATEMENT OF L. R. PATTERSON, ASSISTANT TO THE VICE PRESIDENT IN CHARGE OF ELECTRIC OPERATIONS, PUBLIC SERVICE CO. OF COLORADO, DENVER, COLO.

Mr. PATTERSON. It is a pleasure to be here, Mr. Chairman.

I have a statement that I would like to introduce for the record, and I wish to make an oral statement.

Senator MILLIKIN. It will be copied in full in the record.

(Mr. Patterson's prepared statement follows:)

STATEMENT OF PUBLIC SERVICE CO. OF COLORADO AND SOUTHERN COLORADO POWER CO., RE FRYINGPAN-ARKANSAS PROJECT, COLORADO

The following is a joint statement of Public Service Co. of Colorado, Denver Colo., and Southern Colorado Power Co., Pueblo, Colo., sometimes herein referred to as the companies, in connection with the proposed Fryingpan-Arkansas project.

In the area adjacent to the proposed project, Public Service Co. of Colorado furnishes electric service in the upper Arkansas Valley in Leadville and Salida, Colo., and contiguous areas. Southern Colorado Power Co. supplies electric service in the portion of the Arkansas Valley in Colorado extending from Canon City to the vicinity of La Junta, Colo.

These companies, therefore, are directly interested in the proposed Fryingpan-Arkansas project and the development of hydroelectric power in connection therewith.

The State of Colorado has an area of 103,967 square miles, approximately three-fifths being mountainous. In 1950 its population was 1,325,089, an average of approximately 13 people per square mile. Its area approximates that of the combined states of New York, Pennsylvania, New Jersey, and Delaware with a population in excess of 30,000,000 or about 23 times the population density of Colorado. By reason of its mountainous terrain and limited rainfall, its population is concentrated in cities, towns, and irrigated areas.

The State has an abundance of rich soil and is handicapped only by the limitations of its water supply. The limited amount of precipitation during the growing seasons must be supplemented by irrigation. Basically, this region has an agrarian economy and its productivity, development, and ability to contribute to the national welfare in this respect is limited to the extent that additional water can be made available.

Our companies believe it is only sound economics to develop incidental by-product hydroelectric power in connection with reclamation projects when power generation is economically feasible. Such hydroelectric generation should always be subordinate to the primary purpose of supplying needed irrigation and domestic water. We do believe, however, that it is highly inappropriate for the Government to construct transmission lines where such facilities can be provided by private capital and where existing facilities can be used.

COMPANIES HAVE A PROPOSAL

In making this appearance and presenting this statement before the committee, it is the purpose of the companies to offer a constructive proposal which will:

1. Reduce the cost of the project by utilizing existing transmission lines and by the companies constructing any necessary additional transmission facilities.
2. Improve the economics of the project by providing more net revenue.
3. Provide a plan for the equitable sale and disposition of the project power within the general project area.

We intend to show that our proposal will assure the most dependable and efficient operation of the power generating facilities of the project and will assure substantial benefits to all concerned. Before explaining the companies' proposal and showing how these benefits will be obtained, a brief description giving the location of the hydroelectric stations of the project with relation to the companies' systems and a statement of the expansion programs of the companies is presented.

The proposed plan for the Fryingpan-Arkansas project includes the construction of 6 hydroelectric generating stations in the upper valley of the Arkansas River between Leadville and Salida, Colo., and one hydroelectric generating station on the Arkansas River adjacent to the city of Pueblo.

The Public Service Co. of Colorado presently has a 115-kilovolt transmission line which parallels the Arkansas River between Leadville and Salida, Colo. The six hydroelectric generating stations of the project mentioned above are immediately adjacent to this line. This line, in addition to interconnecting the Leadville service area of the company with the Salida service area, is an integral part of the backbone transmission system of the company. The company and its predecessors have rendered electric service in these areas for more than 45 years meeting all service requirements. The powerplant proposed to be constructed near Pueblo is in the heart of the service area of the Southern Colorado Power Co. where this company has served for more than 42 years.

PUBLIC SERVICE CO. OF COLORADO

The central system of the Public Service Co. of Colorado extends from the Greeley area in north central Colorado southward to the Denver metropolitan area and thence westward to the Leadville area. From Leadville the system has two branches, one extending westward to the Grand Junction area and one extending southward past the city of Salida into the San Luis Valley almost to the New Mexico State line.

As of December 31, 1952, the electric power requirements of the central system were supplied from 6 steam-electric generating stations with a total capability of 344,200 kilowatts and 8 hydroelectric generating stations with a combined capability of 38,050 kilowatts, making a total system capability of 382,250 kilowatts. These 14 generating stations are interconnected with each other and with the principal load centers of the company by approximately 850 miles of high-voltage transmission lines. From this extensive system the company was serving at the end of 1952, 219,478 electric customers. In addition the company was supplying electric energy at wholesale to 3 private electric utility companies and 3 municipal systems which in turn supplied service to many thousands more electric customers.

The Public Service Co. of Colorado has a "wheeling" contract with the Federal Government in connection with the Colorado-Big Thompson project under the terms of which the company's transmission system is being used to supply electric energy from that project to 5 REA systems at 16 points of delivery and to 1 municipal system. Four of these five REA systems have points of delivery relatively adjacent to the Fryingpan-Arkansas project.

Since the end of World War II, the company has made expenditures of nearly $70 million to expand the facilities of its electric system. This has included major additions to 3 of its existing generating stations and 1 new steam electric generating station. The addition of these facilities has doubled the generating capability of the company during the past 7 years. During the same time, the company has built 200 miles of high voltage transmission lines.

At the present time, the company has 3 steam electric generating projects going forward, 2 of which are scheduled for completion at the end of this year which will add 76,000 kilowatts of generating capacity and the third project scheduled for completion in 1955 will add an additional 100,000 kilowatts of generating capacity. Thus, at the end of 1955, the company will have 558,250 kilowatts of generating capacity on its central system, a 200 percent increase since the end of the war. Several transmission line projects are also under construction and planned to keep pace with generating capability.

SOUTHERN COLORADO POWER CO.

The Southern Colorado Power Co. supplies retail electric service in Teller, Fremont, Custer, Pueblo, Crowley and Otero Counties of Colorado. The communities served are in or adjacent to the Arkansas River Valley and in general the system extends from Canon City on the west to La Junta on the east. A branch of the system supplies service to the Victor-Cripple Creek district in Teller County. As of December 31, 1952, the power requirements of the system were supplied from 3 steam electric generating stations and 1 small hydroelectric plant. The total capability of all generating stations was 60,000 kilowatts. These stations are interconnected by a system of transmission lines which in turn supply service to the system load centers and the transmission network consists of approximately 375 miles of 115-kilovolt, 69-kilovolt and 24-kilovolt circuits.

At the end of 1952, the company was supplying retail electric service to 41,500 customers in the area. Service also was supplied on a partial basis to the city of Las Animas. A 115-kilovolt transmission line was completed between Pueblo, on the company's system, and the municipality of Colorado Springs in late 1952. This line permits the interchange of energy between the company's system and the municipally owned distribution system of Colorado Springs and also provides reserve capacity for both.

Southern Colorado Power Co. also supplies wholesale electric service to 3 rural electric cooperative systems at 6 different points of delivery. These systems in turn, of course, furnish retail service to several thousand rural customers in the area.

For the past 10 years the company has made expenditures totaling approximately $11 million for the purpose of expanding its facilities. Included in this program was a new steam-generating unit installed in the Pueblo plant in 1949 and an entirely new steam electric station at Rocky Ford put in service in early 1951.

These units have provided full capacity for the load requirements of the area and additions to substations, distribution systems, and other facilities have enabled us to provide excellent service at all times with completely adequate reserve capacity.

At this time, the company has under construction a 115-kilovolt transmission line between Pueblo and Canon City which will supplement an existing 69-kilovolt line between these two load centers. An additional transmission circuit between Rocky Ford and La Junta is planned for 1954. Preliminary estimates are in preparation covering the possible installation of a new 15,000-kilowatt generating unit on the system. When this unit is installed, generating capability of the system will have been increased 138.5 percent since 1943.

### Proposal of Public Service Company of Colorado and Southern Colorado Power Co.

A. The companies propose to make available their existing transmission facilities and to construct, operate, and maintain at their own expense all additional transmission facilities necessary to market, within and adjacent to the project area, the electric power and energy produced by the Fryingpan-Arkansas project.

B. All power and energy from the project to be sold at the 115-kilovolt plant bus bar at the time the power becomes available with preference given to those customers entitled thereto, such customers to contract either directly with the Federal Government or the companies in accordance with the policy of the Department of the Interior as ultimately determined, the total of firm power contracts not to exceed the capability of the project, as interconnected with the other Bureau projects in the area and as mutually agreed upon by the Department of the Interior and the companies.

C. The companies agree to purchase under long-term contracts all firm power and energy in excess of that contracted for by the preference customers and not otherwise sold or utilized. In addition, the companies agree to contract for such secondary and dump energy and excess generating capacity as the project may have available and not otherwise sold or utilized. Under such plan the project will be assured of the maximum continuous revenue from the time of its completion.

D. The companies agree to accept delivery of power and energy from the project into their transmission systems and to make delivery of an equivalent amount of electric power and energy (adjusted for losses) to the preference customers at delivery points on the companies' transmission systems at voltages of 69 kilovolts and higher or as mutually agreed upon by the companies and the preference customers. For this service the companies to receive compensation to cover the cost of delivery subject to the approval of the Public Utilities Commission of Colorado.

E. The companies agree to the extent that they have capacity available above their own requirements to supply power and energy as standby to the preference customers in the event of inability of the project to meet the customers' contract requirements due to outages or reduction in generation caused by failure of project mechanical and/or electrical facilities.

F. In the event the preference customers in subsequent years require firm power and energy in excess of that supplied from the project or if standby other than that provided in paragraph E above is required or desired, the companies agree to supply these requirements from their own generating facilities at wholesale rates approved by the Public Utilities Commission of Colorado.

### Contemplated Construction Program to Facilitate Marketing of Electric Power From Fryingpan-Arkansas Project

The companies propose to completely integrate the operation of their existing generating facilities with those of the project so as to obtain the most dependable and economical operation of the combined systems. The companies will make available their existing transmission facilities to deliver project power to existing preference customers within and adjacent to the project area. Furthermore they will construct or cause to be constructed additional transmission facilities when and as required for marketing electric power and energy from the Fryingpan-Arkansas project. A preliminary analysis indicates that the following transmission facilities may be required prior to or at the time of completion of the project:

1. A second 115-kilovolt transmission circuit from Leadville to Poncha Junction.

2. Two 115-kilovolt transmission circuits from Poncha Junction to Canon City.
3. A second 115-kilovolt transmission circuit between Canon City and Pueblo.
4. A 115-kilovolt transmission circuit from Pueblo to La Junta.
5. Complete a second 69-kilovolt transmission circuit from Pueblo to La Junta.
6. Necessary switching facilities and transformers to interconnect the new facilities with the existing transmission facilities of the two companies.

BENEFITS OF COMPANIES' PROPOSAL

The proposal by the Public Service Co. of Colorado and by the Southern Colorado Power Co. to provide all additional transmission facilities necessary for the marketing of the electric power developed in connection with the Frying Pan-Arkansas project offers substantial benefits to the following groups:

A. The Federal Government and the Federal taxpayers.
B. The State and local governments and their taxpayers.
C. The Arkansas Valley water users.
D. All project power users including customers of the companies.

*Benefits to Federal Government and Federal taxpayers*

The Federal Government and its taxpayers will receive a twofold benefit from the companies' proposal. First, there will be a reduction of approximately $6 million in the construction cost of the project. Second, there will be estimated annual savings to the project of $414,000 which will be available for repayment of the project.

The reduction in construction cost of the project results from the elimination of the following items of construction from the project plan as set forth in Project Planning Report No. 7–8A.49–1.

| 115-kilovolt transmission lines | Length | Estimated construction cost |
|---|---|---|
| | *Miles* | |
| Dillon-Elbert | 51 | $755,000 |
| Elbert-Otero | 11 | 127,000 |
| Otero-Wapaco | 7 | 104,000 |
| Wapaco-Princeton | 15 | 174,000 |
| Princeton-Poncha | 7 | 80,000 |
| Poncha-Salida | 3 | 35,000 |
| Saguache-Salida | 47 | 494,000 |
| Salida-Pueblo | 97 | 1,124,000 |
| Pueblo-Colorado Springs | 44 | 439,000 |
| Colorado Springs-Limon | 73 | 727,000 |
| Total transmissions eliminated | 355 | 4,059,000 |

| Substations | Capacity (kilovolt-amperes) | Estimated cost |
|---|---|---|
| Dillon | Interconnection | $99,000 |
| Leadville | 15,000 | 118,000 |
| Salida | 5,000 | 85,000 |
| Saguache | 10,000 | 149,000 |
| Canon City | 15,000 | 302,000 |
| Pueblo | 25,000 | 205,000 |
| Colorado Springs | 30,000 | 925,000 |
| Limon | Interconnection | 75,000 |
| Total substations eliminated | 100,000 | 1,958,000 |
| Total reduction in project construction cost | | 6,017,000 |

THIS IS A DIRECT SAVINGS TO THE TAXPAYERS

The reduction in annual costs will be made up of the following items based on estimates made by the companies' engineers:

| | |
|---|---|
| Interest on 3 percent on $6,017,000 | $180,510 |
| Amortization (50 years at 3 percent), 0.89 percent | 53,551 |
| Operation and maintenance: | |
| 355 miles line at $150 | 53,250 |
| 100,000 kilovolt-ampere substation at $0.45 | 45,000 |
| Synchronous condenser | 10,000 |
| Interim replacements: | |
| Transmission, 1.03 percent | 41,808 |
| Substation, 1.53 percent | 29,957 |
| Total annual costs saved | 414,076 |

THIS SAVINGS IS AVAILABLE TO HELP REPAY PROJECT COSTS

From the tabulation of transmission lines to be deleted from the project by the companies' proposal and by reference to the map included in this statement, it will be found that adoption of the companies' proposal eliminates approximately 220 miles of line which would be a duplication of existing lines and some 60 miles which would duplicate a proposed line of the companies between Poncha Junction and Canon City which is presently under consideration for interconnection purposes whether this project is built or not.

By making use of the companies' existing and planned transmission facilities in the project area, duplication of transmission facilities can be avoided, and there will be substantial savings to the Government and taxpayers in the overall cost of the project.

*Benefit to State and local taxpayers*

Should the transmission facilities for marketing the project power be constructed by the Bureau of Reclamation (Federal Government), they will not be subject to taxation by State and local taxing units. On the other hand, if the proposals of the companies is followed, some $4,500,000 of property will be placed on the tax rolls to help support schools, local and State government. This is one of the real advantages of participation in the project by local capital.

*Benefits to Arkansas Valley water users*

The real interest of the Arkansas Valley water users, whether domestic or agricultural, is to obtain additional water supply at a cost which they can afford to pay. Any plan, therefore, which aids the financial feasibility of the Fryingpan-Arkansas project without increasing the cost of water is a benefit to the water users.

The plan proposed by the companies improves the financial feasibility of the project by reducing the project cost by approximately $6 million and reducing annual costs by some $414,000.

*Benefits to project power users including customers of the companies*

The marketing plan proposed by the Public Service Co. of Colorado and the Southern Colorado Power Co. has distinct advantages to the power users who may be supplied from the Fryingpan-Arkansas project. These may be briefly summarized as follows:

1. The plan proposed by the companies takes cognizance of the preference right of existing REA, municipal and governmental agencies at the time the project power becomes available to the extent that such customers contract for the power.

2. Through the use of the existing and proposed facilities of the companies, widespread disposition of the project power can be accomplished immediately and without any duplication of facilities.

3. Reliability of service will be substantially enhanced under the companies' proposal for three reasons. First, the backbone transmission system throughout the Arkansas Valley area under the companies' plan will be double circuit whereas under the project transmission plan, this would be single circuit. This is a very important consideration since an outage of the single circuit line between Salida and Canon City would completely interrupt flow of project power to the lower valley. Second, the two companies have a very large operating and maintenance organization with long years of experience which will insure high quality of service.

Third, the integration of the hydroelectric generating facilities of the project with the steam generating facilities of the two companies will provide the most dependable service which can be obtained.

4. Integration of the facilities of the two companies with each other as well as with those of the project offers advantages by the pooling of reserve, thereby reducing total reserve capacity required, and by postponement of addition of some steam-generating capacity. These advantages benefit all power customers.

COMPANIES REQUEST TO THE COMMITTEE

We respectfully request that the committee accept the companies' proposal to make available their transmission facilities and to construct additional transmission facilities as required and that the committee recommend that no authorization be given for construction of transmission lines by the Bureau of Reclamation in connection with the project provided that suitable wheeling or similar contractual arrangements can be negotiated with the companies for the disposition of the project power.

Mr. PATTERSON. My name is L. R. Patterson. I am assistant to the vice president in charge of electric operations of the Public Service Co. of Colorado, in Denver. I am also speaking on behalf of the Southern Colorado Power Co. in Pueblo.

The statement which I have introduced for the record represents a joint statement of our company and the other company for which I speak. I have been in the electric utility business with the Public Service Co. of Colorado for approximately 30 years. For the last 7 years my responsibilities have included the system load growth and planning as to how we would meet that system load growth.

My responsibilities along that line have also included the negotiation of contracts between our company and the United States Bureau of Reclamation. During that interval we have negotiated several power contracts covering the purchase and interchange of energy. We also negotiated a contract which provided for the Public Service Co. to use its transmission system to make delivery of energy from the Colorado-Big Thompson project to certain REA's. That contract is spoken of as a wheeling contract. I believe that it was the first wheeling contract negotiated in the Rocky Mountain area between the Bureau of Reclamation and a utility company.

Senator MILLIKIN. That wheeling contract had the approval, did it not, of Secretary Chapman, then head of the Department of the Interior?

Mr. PATTERSON. Yes, sir; that is right, it did. It has been in operation now for over 2 years. I will speak a little more of that a little later on.

I want to say from my experience in negotiating on these contracts, that when you are negotiating with the Federal Government, you are negotiating at arm's length and the public interest is certainly well looked after. I also want to state that cooperation between our company and Federal agencies is nothing new. Our first electric power contract with the Bureau of Reclamation dates back to a project on the western slope at Palisade. That contract was negotiated about the year 1932. So we have had very friendly relations for a good many years.

I have also had the pleasure of serving with representatives of the Bureau of Reclamation on joint committees to study the needs of electric energy in both the Missouri River Basin and at the present time I am serving on a committee studying the needs in the Arkansas-

Red River Basin area. I had the pleasure of being named to both of these committees by our good friend the late Judge Stone.

Our companies, for whom I speak, are in favor of the development of the water resources of our State. We realize that we must use this water to irrigate our lands, and to supply the needs of our towns. In this connection, we, as a utility company, want to aid in any way that seems feasible for us to aid. As the Fryingpan-Arkansas project was so ably described here yesterday, you will recall that there are certain hydroelectric generating stations to be built in the upper valley and one hydroelectric generating station to be built adjacent to Pueblo.

I would like to point out on the map that I have here the relation of those generating stations to our system. First I wish to point out that our system extends from the north central part of the State down through the center to the metropolitan area of Denver, and then it extends westward in the mountains to the city of Leadville. At Leadville it branches with one leg of the transmission system going westward almost to the Utah State line, and with one leg of the system extending south through the San Luis Valley practically to the New Mexico State line.

Senator MILLIKIN. What towns are in that westward branch?

Mr. PATTERSON. It goes through Glenwood Springs, Rifle, De Beque, Palisade and over to Grand Junction. The branch going south from Leadville goes through Poncha Junction and Salida, and on down to Alamosa, and serving the San Luis Valley. You will observe that we have a 115,000-volt transmission line through the upper Arkansas Valley which will be adjacent to the six hydroelectric generating stations to be built in that area. Our system has a total generating capacity at the present time of some 382,000 kilowatts.

Senator MILLIKIN. When you refer to "our system," are you referring to Public Service?

Mr. PATTERSON. Yes, sir; the Public Service Co.

Now I will speak briefly of the system of the Southern Colorado Power Co., which extends from Canon City on the west, eastward through the Arkansas Valley to La Junta, and serves in general a good section of the area to be irrigated by the Fryingpan-Arkansas project. They have steam generating stations at Canon City, Pueblo, and at Rocky Ford. They have a total capacity at the present time of approximately 60,000 kilowatts. They, within the last year, have completed a 115,000-volt interconnection between Pueblo and Colorado Springs, which is a municipal system. I believe that Colorado Springs has approximately 60,000 kilowatts of generating capacity either in operation or under construction at the present time.

You will see that there is opportunity here to work out something between our systems and the Fryingpan-Arkansas project. That is the reason that we are here today, to offer to your committee for its consideration a proposal.

Just before I talk about that proposal, there is one thing I do want to mention, and that is that our system at the present time is interconnected with the system of the United States Bureau of Reclamation, built into a connection with the Colorado-Big Thompson. I think the committee may be interested in knowing where we are serving REA's under our wheeling contract.

Senator MILLIKIN. Please tell us that.

Mr. PATTERSON. We receive the energy into our system on the western slope at a substation right near the small town known as Dillon. Then we take that energy through our system——

Senator MILLIKIN. Where is that energy generated?

Mr. PATTERSON. It is generated in the Bureau's hydroelectric plant on the western slope at Green Mountain. Some little bit is generated on the eastern slope and feeds over their transmission lines into Green Mountain and down to Dillon. But as you recall, the eastern slope facilities of the Bureau are not all in operation at this time.

Senator MILLIKIN. Is the Green Mountain generating plant output fully absorbed?

Mr. PATTERSON. Yes. The energy we receive——

Senator MILLIKIN. Do you take all of it?

Mr. PATTERSON. Well, we do not receive very much for our own use. We receive a sizable amount of the output for the use of the REA's.

Senator MILLIKIN. But you take all of the output and you handle part of it for your own use and part of it for REA?

Mr. PATTERSON. Yes. All that is made available to us we can accept. We are rendering this wheeling service to REA's located all along our system. One point of delivery is near this mining town of Gilman. One point of delivery is near Carbondale, which is not shown on the map, but it is located about here [indicating]. One point of delivery is at Rifle. One point of delivery is at DeBeque. Then in this general Grand Junction area we have three different locations at which we make deliveries to the REA over there. We make delivery to one of the REA's just south of Leadville.

Senator MILLIKIN. Is this all Bureau of Reclamation power?

Mr. PATTERSON. That is right. All of the energy we supply to REA's at the present time is under our wheeling contract. We make no direct sales to the REA's.

Senator MILLIKIN. Those contracts were completed during the time that Secretary Chapman was head of the Bureau?

Mr. PATTERSON. Yes, sir. During 1951 all of these went into operation. I believe the date of our wheeling contract was August 1950 and then we began wheeling operations during 1951.

Then we make delivery near the town of Salida, and then in the San Luis Valley we have four different locations at which we are supplying these REA's. The Intermountain REA we serve east of Leadville. It is not shown on the map but it is just a small place.

Senator MILLIKIN. I am sorry to interrupt but I want to keep absolutely straight. Are you serving Bureau power in the San Luis Valley?

Mr. PATTERSON. Yes, sir; from the Colorado-Big Thompson project. And in the Denver metropolitan area, we wheel to Intermountain REA west of the city of Denver and east of the city of Denver near Strasburg. You will notice there is a broken line on the map. That is a new transmission line we are building to improve our service to REA in the Strasburg area. We look on these REA's as still being our customers although they are not. That is, we give them the same type of service that we give anybody else. If the line is down, we would be just as quick to get it up under the wheeling arrangement as under any other.

The contract which we have adequately protects the REA's. We have found that our relations with these people are excellent.

Senator MILLIKIN. There has been no general complaint?

Mr. PATTERSON. No, sir; none that I know of.

Senator MILLIKIN. Do you know of any specific complaints?

Mr. PATTERSON. No, sir. Then here is an interesting thing——

Senator MILLIKIN. Would you say that up to this time at least your operations in wheeling this bureau power for the service of REA's has been a successful operation from the standpoint of all parties?

Mr. PATTERSON. I believe so, yes, sir. I want to illustrate that by saying that we operate an isolated system in the eastern part of the State between Sterling and Brush. You will notice that that is interconnected to the main part of our system through a transmission line owned by the Bureau of Reclamation. They also wheel for us. Our wheeling contract provides for either party wheeling for the other. So they are wheeling energy from our main central system out to the Sterling-Brush area. We pay them for the wheeling service under the same schedule of rates that they pay us. So it works each way.

Senator MILLIKIN. Will you point out, again, our own line, in northeastern Colorado, from where to where?

Mr. PATTERSON. From the area near Brush up to Sterling. That is a 44,000-volt line that was built about 1926. The other line is a 115,000-volt line of the Bureau that was built within the last 6 or 7 years. I don't remember the exact year.

Senator MILLIKIN. And you supply your power, which is wheeled by the Bureau out to Brush?

Mr. PATTERSON. Yes, sir.

Senator MILLIKIN. And then it goes through your line from Brush up to Sterling?

Mr. PATTERSON. We actually have a point of delivery at Brush and we have one at Sterling. So they are wheeling to us at each of those locations the same as we wheel for them to a number of locations.

Senator MILLIKIN. And the rates in terms of service are the same?

Mr. PATTERSON. That is right. It is a two-way contract. It works the same in each direction, compensation for losses and everything. It is the same in each direction.

There is one thing I might point out in connection with the Green Mountain plant, and that is that the Bureau has a line that goes over into northwestern Colorado that is served from Green Mountain, so there is also some output from Green Mountain that does not go into our system.

Senator MILLIKIN. The Green Mountain plant is part of the Colorado Big Thompson project?

Mr. PATTERSON. Yes, sir.

Senator WATKINS. How do you generate your power?

Mr. PATTERSON. We have some small hydroplants, but our main generation is by steam. At the present time, approximately 10 percent of our generation is hydroelectric and the remainder is by steam. So we are, to all intents and purposes, a steam generating organization.

Senator WATKINS. I assumed that was the condition. I noticed in your reply to Senator Millikin you said the rates that you charge and that the Bureau of Reclamation charges are the same?

Mr. PATTERSON. That is on the wheeling service.

Senator WATKINS. On the wheeling service?

Mr. PATTERSON. Yes, sir.

Senator WATKINS. How about the rates to customers? The wholesale rates, for instance, to the REA's. Do you have the same rate as the Bureau charges the REA's?

Mr. PATTERSON. No, sir; we do not. Our rate is somewhat higher than theirs.

Senator WATKINS. How much higher?

Mr. PATTERSON. I would say that on a given load—well, it would depend on the hours use. Let's take, for example——

Senator WATKINS. I mean firm power.

Mr. PATTERSON. Yes. At a 50 percent load factor the wholesale rate which we have would probably run 9½ mills or something like that, and the Bureau's rate runs about 7 mills, I believe. I do want to emphasize again that at the present time we do not sell to any REA's in the State.

Senator WATKINS. Do you have any wholesale power sales?

Mr. PATTERSON. Yes, sir.

Senator WATKINS. Comparable to the REA sales?

Mr. PATTERSON. Yes, sir.

Senator WATKINS. And that is the difference. Your rate is that much higher?

Mr. PATTERSON. That is right.

Senator WATKINS. How are the rates regulated in Colorado? Are they not done the same way as they are done in most States, through a public utilities commission?

Mr. PATTERSON. That is right. We have a public utilities commission which has jurisdiction over our wholesale rates.

Senator WATKINS. Do you know how the Bureau's rates are fixed?

Mr. PATTERSON. They are not subject to any State regulation.

Senator WATKINS. How are they determined? Who determines their rates, the Bureau of Reclamation?

Mr. PATTERSON. I don't know. I presume it is the Secretary of Interior.

Senator WATKINS. In other words, the Government is in full operation of the electrical power development end of the thing at least?

Mr. PATTERSON. That is right, sir.

Senator WATKINS. Is there any surplus power in there now?

Mr. PATTERSON. In our system?

Senator WATKINS. Is there any where this project is to be developed?

Mr. PATTERSON. Our system has a little surplus, sir. I cannot speak for the others. I believe that the Bureau will have, when they complete the Big Thompson, but I am sure it will all be bought.

Senator WATKINS. What about when this project is completed? Will there be a lot of surplus power then?

Mr. PATTERSON. No, sir; I think there will be ample load to use it up. Our stand on these hydroelectric projects of the Government has been that whenever they have surplus power available for sale we will reduce the generation on our steam units and absorb whatever hydroelectric energy is available so the water will not go to waste. The rate of load growth in that area has been sufficiently great that it is only just a very short while until you are right back to where you are using your steam units the way you always were and adding in

more. Our experience has been that we just have to keep on adding steam generating units anyway.

Senator WATKINS. In spite of the fact that the Bureau has this development?

Mr. PATTERSON. That is right, sir.

Senator MILLIKIN. You have recently opened a new large steam plant, have you not?

Mr. PATTERSON. Yes, sir; that is right. Since the end of World War II, we have more than doubled our own generating capacity, and during the same time of course, the Bureau has been building the Big Thompson.

Senator MILLIKIN. So you have done that on your own while the Bureau power was coming in at the same time?

Mr. PATTERSON. That is right.

Senator MILLIKIN. You are not yet saturated out there, are you?

Mr. PATTERSON. No, sir. I would say that all of the Big Thompson energy will be contracted for by the end of this year. At the moment we are in negotiations with the Bureau. Of course, the first thing they are having to find out is how much output of the Big Thompson its preference customers want, and then we will buy what they have left. We expect to know within the next several months how much that will be, and we have agreed to buy everything that they make available to us.

Senator MILLIKIN. What is your rate of growth and consumption through some past period of time, which you can pick for yourself?

Mr. PATTERSON. Well, our experience since way back, say about 1936 or 1937, after we were well out of the effects of the depression, our rate of growth has averaged 9.1 percent, I believe it is, compounded, sir. That really builds up in a hurry. If your load growth is at a rate of about 6.8 percent, I believe it is, it will double every 10 years which is a very remarkable thing. I mentioned a while ago that I have been in the business for exactly 30 years. Our load this winter at the same time that I will be completing 30 years of service with the company will be 8 times as large as it was when I started. So you see, in the first 10 years we went to twice, and in the next 10 years we went to 4, and in the next 10 years it was to 8 times, and it is 8 times as great. I know in connection with this subcommittee that I mentioned I served on with the Missouri Basin Interagency Committee, that the State of Colorado had three members of their committee. I was one member, a representative of the Bureau of Reclamation, and a representative of the State utilities commission constituted the other two. We were the three named by Judge Stone. We went to a meeting down in Sioux City and we presented our estimates. We estimated for that section of the State within the Missouri Basin that the rate of load growth would be something in excess of 8 percent for the next 20 years. And they practically threw us out of the place. They said, "Whoever heard of such growth? We don't experience anything like that." I was asked if I could offer anything, and I said, "Well, the difference is that we in Colorado have the best part of the Missouri Basin. Regardless of what you fellows are expecting to experience in other areas of the Missouri Basin, we expect to average 8 percent."

Senator MILLIKIN. And you did, did you?

Mr. PATTERSON. We have been. I don't know, it seems to me when you have spent a long time in this business that you can only be optimistic. I would say from the work I have already done on the subcommittee on the Arkansas-White-Red River Basin for the State—incidentally Mr. Christy who spoke here yesterday is the chairman of that group—from the work we have done on that group, I would say there will be ample opportunity to sell all of the energy produced by the Fryingpan-Arkansas. There will not be any problem in marketing that energy. We must remember that these hydroelectric stations of the Fryingpan-Arkansas are not going to go into operation tomorrow or next week. It will be some years from now. And they will not all go into operation on the same day. So there will be ample opportunity to absorb the energy within the region.

Senator MILLIKIN. Your opinion is the same as the Bureau's opinion on the absorbing capacity of the served communities during the future life of this project?

Mr. PATTERSON. That is right. This project is not out of reason in size and comparison to the market in the area, these are not enormous hydroelectric developments, but this is a comparatively small hydroelectric project, and it is well within the ability of this area to absorb.

Senator MILLIKIN. Senator Jackson, has not your area absorbed a whole lot more power than anybody estimated originally?

Senator JACKSON. Yes. We have, of course, from the very beginning underestimated the power demand. When Grand Coulee was undertaken, it was suggested that the only use would be to probably take care of the jackrabbits of which there was a great supply in eastern Washington. I might point out that Coulee is producing today 2 million kilowatts of power which, by comparison, that one dam is half of the entire output currently of the TVA. TVA is producing about 4 million. Coulee alone is producing 2 million and we are short of power. You are familiar with the overall power situation in the country today?

Mr. PATTERSON. Yes, sir; I am.

Senator JACKSON. The Defense Electric Power Administration estimated we would consume about 70 million kilowatts?

Mr. PATTERSON. That is right.

Senator JACKSON. I think they projected the overall expansion to about 25 million for a period of the next 4 or 5 years.

Mr. PATTERSON. That is right, sir.

Senator JACKSON. So we have today, Mr. Chairman, I believe a deficiency of about 50 million kilowatts. You can pretty much determine the military capacity and military extent of a country in terms of kilowatt-hours, can you not?

Mr. PATTERSON. That is right, sir.

Senator JACKSON. I mean it is very essential to the industrial extent of the country which in turn is essential to a sound, strong, and healthy military potential.

Senator WATKINS. I would like to ask some questions about your program. Let us assume that without this program the power needs will be, of course, about what they will be with the program. How would you take care of it, ordinarily?

Mr. PATTERSON. Adding more steam units.

Senator WATKINS. Would that be feasible as compared with a proposal like this?

Mr. PATTERSON. That is right.

Senator WATKINS. Can you compete with them under the terms that they get their money and build these projects?

Mr. PATTERSON. They may come up with wholesale rates that are slightly lower than ours, sir. That is true because of the cost of money of the Federal Government being less than ours.

Senator JACKSON. What will be the cost of this power? Ten mills, eight mills?

Mr. PATTERSON. From the Fryingpan-Arkansas?

Senator JACKSON. Yes. Do you know?

Mr. PATTERSON. I believe in the project report it says 5½ mills.

Senator JACKSON. What is your steam cost, counting amortization and everything? Do you have that?

Mr. PATTERSON. Yes, sir. At the present time it is approximately 6¾ mills.

Senator JACKSON. That is pretty good.

Mr. PATTERSON. Yes.

Senator JACKSON. In some of these new steam plants such as the new ones that have gone into the TVA with new devices and advanced mechanization, they are reducing the cost of steam generation quite substantially, as I understand it. Is that correct?

Mr. PATTERSON. Yes, sir; that is right. And you must remember that in our State we have very large fuel resources. We have a lot of coal.

Senator JACKSON. By interconnecting with the Bureau's system, with your steam plants you can firm up a lot of the hydropower, is that not true?

Mr. PATTERSON. That is right, sir.

Senator JACKSON. We are doing it, of course, in the Northwest to a certain extent. But you have low water periods in Colorado on your streams just as you do in every other section of the country.

Mr. PATTERSON. That is right, sir.

Senator MILLIKIN. Where do you get your fuel, Senator?

Senator JACKSON. The private utilities, Mr. Chairman, have the steam plants, and they use mostly coal, oil, and for a while they use log fuel, that is, wood waste. But we are deficient, of course, in both coal and oil.

Senator MILLIKIN. Do you import that?

Senator JACKSON. We use some of it locally, Mr. Chairman. We are in the process of doing some studies on determining whether certain low-grade coal deposits can be used for steam generation. I introduced a bill in the last Congress to provide for some steam plants for Bonneville Power, to help firm up the hydro system. Let me ask just one or two questions, if I may.

Senator WATKINS. That will be all right. Go ahead, Senator.

Senator JACKSON. What is your wheeling arrangement now with the Bureau of Reclamation? How much do you charge on the wheeling arrangement that was worked out with the Bureau?

Mr. PATTERSON. It is on a zone basis. In zone 1, the wheeling charge is 1 mill.

Senator JACKSON. How many miles is that?

Mr. PATTERSON. That is up to 50 airline miles from the point where the power is put into our system, regardless of how the lines may wander through the mountains. Zone 2 is 2 mills, and that is 50 to 100 miles. Zone 3 is 3 mills and that is 100 to 150 miles.

Senator JACKSON. How does that compare with the other wheeling agreements that the Department of the Interior has entered into, do you know?

Mr. PATTERSON. I have tried to check up on that and I have found that where long distances are involved, such as we have in our State, that we are very much in line. I have found out that in contracts such as the Pacific Gas & Electric, where it is on a postage stamp basis, that actually most of their wheeling is a comparatively short-range wheeling, usually not more than 50 miles.

Senator JACKSON. Your line loss gets fairly heavy when you get beyond what, 100 miles, or 75 miles?

Mr. PATTERSON. Yes, sir; that is true. Our compensation for line loss, incidentally, is the lowest that is in any wheeling contract. We are compensated 3 percent for losses in zone 1, 6 percent for zone 2, and 9 percent in zone 3. I believe that is the lowest.

Senator JACKSON. Do you feel that you would be able to enter into the same kind of contract to carry this power to preferred customers?

Mr. PATTERSON. Yes, sir.

Senator JACKSON. That is, the contract that you now have with the Department of the Interior?

Mr. PATTERSON. Yes, sir; we could.

Senator JACKSON. You contemplate having some discussions with the Department on the question of wheeling; do you?

Mr. PATTERSON. Yes, sir. And we offer not only our existing facilities but we offer to build at our own expense any additional facilities needed as we will indicate on this map.

Senator JACKSON. How much of this power will go to the preferred customers, for instance the municipal plant in Colorado Springs, I believe it is? Do you know offhand if most of this power will go to preferred customers?

Mr. PATTERSON. Well, it could. We took a rough look at it. We do not know of our own knowledge what the city of Colorado Springs will want to do. They are right now completing a new steam plant, which will be very adequate. But if they should want to buy a substantial portion of their requirements, I would say the preference customers would probably immediately contract for at least half of the output.

Senator JACKSON. How much power is involved in this project, do you know offhand, how much firm and how much secondary?

Mr. PATTERSON. I believe that Mr. Powell testified 400 million kilowatt-hours of firm.

Senator JACKSON. In kilowatt-years that would be how much?

Mr. PATTERSON. I don't remember how many kilowatts of firm. Mr. Powell could probably answer that.

Senator MILLIKIN. What do you say, Mr. Powell? How much is that?

Senator JACKSON. I understand your testimony is they are building a steam plant in Colorado Springs, a municipal steam plant.

Mr. PATTERSON. Yes, sir.

Senator ANDERSON. And it is about to be finished?

Mr. PATTERSON. Yes, sir.

Senator MILLIKIN. Let us have the answer from Mr. Powell.

Mr. POWELL. This power is just about at a 50-percent use factor and that would make roughly about 57,000 kilowatt-years.

Senator JACKSON. Of firm?

Mr. POWELL. About one-fifth of that is secondary.

Senator JACKSON. The total is 57,000?

Senator MILLIKIN. I did not hear the last thing you said. How much firm and how much secondary?

Mr. POWELL. In kilowatt-hours, Senator, there is 400 million kilowatt-hours of firm power and an additional 105 million—did I say million before—kilowatt-hours of secondary, making a total of 505 million total, and that operates at about a 55-percent use factor.

Senator JACKSON. Of course, much of the secondary power you can firm up with steam generation so the new steam plant going in at Colorado Springs could be very well, I take it, integrated into the system.

Senator ANDERSON. Is that 50,000 or 500,000 kilowatt-years?

Mr. POWELL. 57,000 kilowatt-years total.

Senator ANDERSON. I figured 500. What is wrong with that? Would you tell us how you get your 57,000 again?

Mr. POWELL. I do not use that term in my figure. I simply multiplied the total installed capacity by the use factor. You don't use that as kilowatt-years in the Arkansas Valley. Mr. Patterson, could you answer that from the statements I have given?

Senator ANDERSON. How many days are there in a year in Colorado, a different number than anywhere else?

Senator MILLIKIN. If it is important, let us translate it. What is the correct answer?

Mr. PATTERSON. I think probably—and please back me up on this, Mr. Powell—an answer to Senator Jackson is that the firm kilowatt capacity on the load factor of that general area out there is approximately 80,000. Isn't that about right?

Mr. POWELL. That is right.

Mr. PATTERSON. It is about 80,000 kilowatt at the load factor experienced in that area. We don't have any aluminum plants or anything that run every hour in the year, but it is about 80,000.

Senator JACKSON. Besides Colorado Springs, the municipal light plant at Colorado Springs, what other customers are there in the area? Are there REA co-ops?

Mr. PATTERSON. Yes, there are several REA's, and there are several other municipal systems on down the Arkansas Valley. Some of these other people who live in the valley can probably answer that easier than I can, but I know there are several.

Senator JACKSON. So in all probability, most if not all the power will go to the preferred customers, either the local municipal light plants or REA co-ops under the law?

Mr. PATTERSON. I would say that at least half of it would go to them, and perhaps more.

Senator MILLIKIN. Mr. Patterson, I believe it would be well for you to point out, again, how you are already wheeling Bureau power and delivering it to preferred customers and REA's.

Mr. PATTERSON. Yes, sir; I would like to do that.

Senator JACKSON. Yes. I asked him what the rates were a moment ago.

Mr. PATTERSON. At the present time we, Public Service Co. of Colorado, have a transmission system that is in the north central part of the State, north of Denver, and then extending westward through the mountains from Denver up to the mining town of Leadville. At Leadville 1 branch of the system runs westward practically to the Utah line, and 1 branch runs southward practically to the New Mexico line.

Senator JACKSON. What are those, 120-kilovolt lines?

Mr. PATTERSON. 115 kilovolts, most of them, with some lower voltage on the ends. We are interconnected with the United States Bureau of Reclamation, the Colorado Big Thompson project which has been in operation for some years, and they will complete their eastern slope power units along sometime this year, later in the year. At the present time, the energy which we wheel, we receive into our system at Dillon.

Senator JACKSON. That is at Leadville?

Mr. PATTERSON. No, that is north of Leadville. That is right near the town of Dillon. It is a very small town.

Senator MILLIKIN. That is energy which comes from Green Mountain generating plant which is on the western slope of the Colorado Big Thompson project?

Mr. PATTERSON. That is right. And that energy is introduced into our system near the town of Dillon. From there we wheel to 1 REA located in the Grand Junction area, and we deliver at 4 different locations in that area. We have 4 different substations we supply power to.

Senator WATKINS. Do you mean Public Service Co. of Colorado?

Mr. PATTERSON. Yes, sir.

Senator WATKINS. I thought you were speaking for the Southern Colorado Service Co.

Mr. PATTERSON. Yes, sir.

Senator WATKINS. You are speaking for both of them?

Mr. PATTERSON. Yes, sir.

Senator MILLIKIN. You are speaking of one, depending upon the other. When we are in the lower part, you are speaking about the Southern, and in every other place you are speaking about Public Service?

Mr. PATTERSON. Yes, sir.

Senator JACKSON. Is that a wholly owned subsidiary?

Mr. PATTERSON. There is no financial or management tie between our companies at all. We are separate and distinct companies. When we appeared in the House, Mr. David Hyer, the president of Southern Colorado, was here, but he had to go back home. So I am speaking for both his company and our company.

Senator JACKSON. Could you tell the committee the customers that you serve under your wheeling agreement, if you could designate them?

Mr. PATTERSON. There are five REA's. In the western end of the system——

Senator JACKSON. That is around Grand Junction?

Mr. PATTERSON. Yes, sir. Grand Valley REA. We serve them at four locations. Then starting in at Rifle and extending eastward,

we serve Holy Cross REA at three different locations. Then in the Leadville area, and southward through the upper Arkansas Valley, we serve Sangre de Cristo REA, at two locations. In the San Luis Valley we serve the San Luis Valley REA at four locations. In the area just east of Leadville, at a little place called Fairplay, and in the Denver area just west of the city of Denver and east of the city of Denver, near Strasburg, we serve Intermountain REA at these three locations.

If I have not missed any locations, that should add up to a total of 5 REA's at 16 points of service.

Senator JACKSON. So they are all REA?

Mr. PATTERSON. Yes, sir.

Senator JACKSON. You do not serve a municipal system?

Mr. PATTERSON. We serve one small municipal system north of Denver, a very small municipal system.

Senator WATKINS. Do I understand that your company is willing to purchase power from this project and retail it and distribute it to the people of the area?

Mr. PATTERSON. That is right, sir.

Senator WATKINS. That is in addition to your wheeling arrangements?

Mr. PATTERSON. That is right, sir.

Senator WATKINS. And that is in part of your proposal?

Mr. PATTERSON. That is right, sir.

Senator WATKINS. The rates that you, of course, would charge would be fixed by the Utilities Commission of Colorado?

Mr. PATTERSON. That is right, by the public utilities commission of the State. We are under regulation by the public utilities commission of the State.

Senator WATKINS. May I inquire if this project has an arrangement or anything in there for transmission lines to powerplants?

Senator MILLIKIN. I do not think they have transmission lines. Do you have transmission lines in this project at the present time?

Mr. POWELL. Senator, there are estimates in the estimate approximately $6 million of transmission lines and switching stations, about 400 miles distribution system.

Senator MILLIKIN. That would be eliminated if this proposal that is being made became effective.

Senator WATKINS. Does the bill authorize the construction by the Government of transmission lines? And if so, to what extent?

Senator MILLIKIN. Does it? That is in the operating portion.

Mr. POWELL. That is in the plan.

Senator WATKINS. Why did you put it in the plan if you have a utility there that would be willing to take a contract for wheeling for all the preferred customers and would buy the power?

Mr. POWELL. Senator, at the time this plan was drawn, this agreement had not materialized. But I might say that the estimate of the distribution system is, in our opinion, the best measure of the base on which to negotiate.

Senator WATKINS. In other words, you want authority in the bill to build these transmission lines so that you will have some bargaining power, is that the idea?

Mr. POWELL. I would rather not answer that question in my subordinate capacity.

Senator MILLIKIN. Do not be afraid to say so. That would be a very laudable purpose.

Senator WATKINS. I think it would be a very laudable purpose because personally I feel if we cannot get for these projects reasonable contracts for the distribution of the power then we ought to build transmission lines but only on the condition that we cannot get a reasonable contract from people in the business. I do not think the United States Government ought to go into the business of retailing and distributing power if it can get it done by private enterprise on a reasonable basis. That is why I am asking these questions.

Mr. POWELL. As I explained, it was the measure of the value of distribution of power. If the negotiations materialized, we were standing on firm ground.

Senator WATKINS. I see what you mean.

Senator MILLIKIN. Proceed, Mr. Patterson.

Senator ANDERSON. What do you expect to pay for this power? Did you say?

Mr. PATTERSON. I believe that the project report, Senate Document 106, indicates 5½ mills.

Mr. BEISE. In answer to Senator Watkins' question, may I observe, sir, that the proposal of the power companies have only materialized within the last, you might say 2 weeks, and consequently, sir, this Senate document, having been prepared many months before, explains the discrepancy.

Senator MILLIKIN. Senator Johnson and I introduced this bill before we ever heard of this.

Senator JACKSON. May I ask a question, Mr. Chairman?

Senator MILLIKIN. Yes.

Senator JACKSON. Am I correct in understanding that this project comes under section 4 of the Flood Control Act of 1944 on the sale of power to preferred customers? Or is this project exempt from that?

Senator MILLIKIN. No, no.

Senator JACKSON. It is subject to that. So there is no need in here for anything about a preference clause. It is subject to the Flood Control Act, as to the sale of power.

Senator MILLIKIN. The only important point is, from the standpoint of the witness, to make it clear that if they transmitted the power they would carry out the preference.

Senator ANDERSON. They say this is not under the Flood Control Act.

Mr. WITMER. My name is T. R. Witmer, Bureau of Reclamation. I wonder if I might answer the Senator's question.

Senator MILLIKIN. Yes.

Mr. WITMER. It does not fall under the Flood Control Act of 1944. It falls, however, under the reclamation laws which, themselves, have provisions for this.

Senator JACKSON. It is more or less identical with that?

Mr. WITMER. Substantially identical.

Senator JACKSON. What is the difference?

Mr. WITMER. I would have to compare the text. I cannot answer you. I do not believe in practice there is any difference.

Senator ANDERSON. Mr. Powell said we have an offer from two large companies in the State of Colorado requesting that the power which this project indicates to be produced be sold to them as pur-

chasers. If you plan to sell to them as purchasers, you do not intend to sell to the REA, do you?

Mr. WITMER. As I understand the offer which has been made by the company sir—and I am sure I will be corrected if I do not—it is that power will be sold at the bus bar to be delivered to preference customers.

Senator JACKSON. To be wheeled?

Mr. WITMER. To be delivered to preference customers over the company line as a wheeling arrangement. The companies, however, to pick up and purchase all power that the preference customers do not take under that arrangement. My understanding is correct?

Mr. PATTERSON. That is correct, sir.

Senator JACKSON. As I understand a preferred customer, supposing this power is sold at the wholesale rate at the bus bar for 5 mills, 5½ mills, whatever it is according to the Senate document, then you would wheel that power in accordance with the schedule you previously testified, which is 1 mill for the first 50 airline-miles with a graduated increase, to the preferred customers, the preferred customer getting the power at the Bureau of Reclamation wholesale rate, which is 5½ mills, and in addition the preferred customers would pay for wheeling charge. Is that substantially correct?

Mr. PATTERSON. That is approximately right, sir. At the present time under our Colorado-Big Thompson wheeling it works like this: The preference customer is not our customer. He is a customer of the Bureau. His bill is received from the Bureau and his bill is the Bureau's postage stamp rate plus all of the wheeling charge in excess of 1 mill. The Bureau absorbs 1 mill on the basis that they would have had investment in transmission facilities and transmission expense if they had built their own line.

Senator JACKSON. In other words, you bill your wheeling charge to the Bureau, and instead of having two separate accounts, the Bureau in turn bills the preferred customer for the full amount?

Mr. PATTERSON. That is right, sir.

Senator JACKSON. The postage stamp rate simply means it is the same rate at the bus bar or within—what is it, 200 miles or what is the range?

Mr. PATTERSON. I do not know what their range is in that area.

Senator JACKSON. What is the range of the postage stamp rate in the Colorado area served by the Bureau?

Mr. WITMER. I cannot tell you; I am sorry.

Senator JACKSON. At any rate, by the postage stamp rate you mean the charge is the same within a given customer area, whether you are at the dam or 100 miles from the dam?

Mr. PATTERSON. That is right, sir.

Senator MILLIKIN. Mr. Patterson, I believe it would be a good idea for you to tell us your proposal.

Mr. PATTERSON. I think so. I think it would help a lot if I were just to run over that. It would not take very long to read it. The proposal is this [reading]:

> The companies propose to make available their existing transmission facilities and to construct, operate, and maintain at their own expense all additional transmission facilities necessary to market within and adjacent to the project area, the electric power and energy provided by the Fryingpan-Arkansa project.
>
> All power and energy from the project to be sold at the 115 kilovolt plant bus bar at the time the power becomes available with preference given to those cus-

tomers entitled thereto, such customers to contract either directly with the Federal Government or the companies in accordance with the policy of the Department of the Interior as ultimately determined.

May I stop just a moment to explain why we put that in there. As it is now the preference customers are the customers of the United States Government. As you gentlemen may know, there are some offers from other areas of the United States, I believe in the southeastern part of the United States, where they are trying to determine whether the preference customer should be the customer of the Government or of the utility. What we are saying is that we will go either way, whichever way the Department of the Interior wants to go. At the present time the preference customers that we wheel to are the customers of the Federal Government. So far as we are concerned, that is all right. They may stay that way.

If the Department of the Interior should ultimately decide that they want the customer to be the customer of the utility, that is all right. We will go that way.

The total of firm power contracts not to exceed the capability of the project as interconnected with the other Bureau projects in the area and as mutually agreed upon by the Department of the Interior and the companies.

The companies agree to purchase under long-term contracts all firm power and energy in excess of that contracted for by the preference customers and not otherwise sold or utilized. In addition, the companies agree to contract for such secondary and dump energy and excess generating capacity as the project may have available and not otherwise sold or utilized. Under such plan the project will be assured of the maximum conclusive revenue from the time of its completion.

The companies agree to accept delivery of power and energy from the project into their transmission systems and to make delivery of an equivalent amount of electric power and energy, adjusted for losses, to the preference customers at delivery points on the companies' transmission systems at voltages of 69 kilovolts and higher or as mutually agreed upon by the companies and the preference customers. For this service the companies to receive compensation to cover the cost of delivery subject to the approval of the Public Utilities Commission of Colorado.

The companies agree to the extent that they have capacity available above their own requirements to supply power and energy as standby to the preference customers in the event of inability of the project to meet the customer's contract requirements due to outages or reduction in generation caused by failure of project mechanical and/or electrical facilities.

In the event the preference customers in subsequent years require firm power and energy in excess of that supplied from the project or if standby other than that prefaced in paragraph E above is required or desired, the companies agree to supply these requirements from their own generating facilities at wholesale rates approved by the Public Utilities Commission of Colorado.

That, sir, is our offer.

Senator JACKSON. How does that proposal differ, if any, from the one that you are now operating under in Colorado with the Bureau of Reclamation?

Mr. PATTERSON. It does not differ in any principal respect, sir. The main difference is that we are coming in at the start now, having felt that our experience with wheeling has worked out all right. We are coming in at the start and offering to build all the necessary lines. In connection with the Big Thompson we did not even think about the advantages of the wheeling contract idea until after the project was well under way. Having had the experience we have had, we feel that it has worked out. It has worked out so that we are satisfied, and we believe those REA's we wheel to are satisfied.

Senator MILLIKIN. Before you came in, Senator Anderson, it was developed that this is a two-way thing, that the Bureau out there

over its lines transmits wheeling power for the Public Service Co., and the Public Service Co., under its line it has been developed, transmits Bureau power. Those contracts were negotiated with Secretary Chapman when he was in office.

Senator ANDERSON. Yes. It does seem to me, Senator Millikin, that it would be very desirable to keep from building these transmission lines if we could do so. If a private utility already has them constructed——

Senator JACKSON. As long as the wheeling agreement charges are fair and just. There has been a big fight, as you know.

Mr. PATTERSON. Yes.

Senator JACKSON. Some of the companies have not been as fair-minded, I think, as yours. I do not recall how all the other wheeling rates compare. Some of the companies proposed rates that were entirely out of line. I take it from your testimony that your wheeling rates are pretty much in line with the original ones that were entered into by the Department of the Interior dating back to Texas Power & Light, which I think was the first wheeling contract.

Mr. PATTERSON. I think that is right.

Senator JACKSON. Is there anyone from the Bureau who could testify as to the rates charged by this company as compared with the other wheeling rates?

(No response.)

Senator MILLIKIN. Senator Anderson, it has already been developed that when the Service Co. does the wheeling for the Bureau, the charges and conditions are the same as when it is vice versa.

Senator ANDERSON. Yes. I was just saying that it would seem to me that they might check to see how this general arrangement compares with other arrangements around the country.

Senator JACKSON. Yes. I think I would like to have the Bureau supply the information as to the rates charged by the Colorado company. I assume you would like to have that, too.

Mr. PATTERSON. Yes.

Senator JACKSON. As compared with other contracts for wheeling power.

Senator MILLIKIN. Will the Bureau supply us with that?

Mr. TOMLINSON. We will be glad to. I might say in passing that when Assistant Secretary Aandahl was here yesterday morning and also when he testified before the House committee last week, he stated that they had looked into this contract in a general way, and generally it looked all right. He would like, of course, to reserve the right to make a detailed study of it first, but on the surface it looked all right and he was in favor of this type of thing if it could be worked out.

He did point out that he was not prepared to say that the authorization should be amended to delete the provision for the construction of the lines in the event that we could not work out a satisfactory wheeling arrangement with them, but certainly if we could work it out he was in favor of proceeding on the basis of wheeling the project power.

(The requested information follows:)

The proposal to the Interior and Insular Affairs Committee in connection with Fryingpan-Arkansas project Colorado by Public Service Co. of Colorado and Southern Colorado Power Co. contains item D on page 9 as follows:

"D. The companies agree to accept delivery of power and energy from the project into their transmission systems and to make delivery of an equivalent amount of electric power and energy (adjusted for losses) to the preference customers at delivery points on the companies' transmission systems at voltages of 69 kilovolts and higher or as mutually agreed upon by the companies and the preference customers. For this service the companies to receive compensation to cover the cost of delivery subject to the approval of the Public Utilities Commission of Colorado."

On the presumption that the procedure contemplated would be similar to the transmission arrangements provided in the existing transmission service contract between Public Service Co. of Colorado and the Bureau of Reclamation, the compensation to the companies and the power and energy deliverable to the companies to offset losses in delivering power and energy from the points of receipt from the Bureau to the points of delivery to customers would be as follows:

For delivery at a point within a 50-mile radius from any point of interconnection between the systems of the Bureau and the companies—1 mill per kilowatt-hour plus 3 percent of power and energy delivered off the companies' systems.

For delivery at a point between a 50- and a 100-mile radius from any point of interconnection between the systems of the Bureau and the companies—2 mills per kilowatt-hour plus 6 percent of power and energy delivered off the companies' systems.

For delivery at a point within a 100- and a 150-mile radius from any point of interconnection between the systems of the Bureau and the companies—3 mills per kilowatt-hour plus 9 percent of power and energy delivered off the companies' systems.

The above compensation and losses compare with the provisions in other major transmission service arrangements made by the Bureau with other utilities as follows:

MONTANA POWER CO.

The compensation and provision for losses are by zones identical with the zones provided in the Public Service of Colorado contract and provide for a similar compensation except that the losses provided are 4, 8, and 12 percent in the first three zones. A fourth zone beyond a 150-mile radius is provided in which the compensation is 4 mills per kilowatt-hour and 16 percent losses.

PACIFIC GAS & ELECTRIC CO.

The compensation and losses provided for in this agreement for transmission over the company's transmission system in the Central Valley of California, exclusive of a small stated area in the bay region and regardless of distance of transmission, is 1 mill per kilowatt-hour plus 22 cents per kilovolt-ampere of power delivered through substations of the company and the delivery of power and energy for losses equal to 5 percent of the amount delivered at 44 kilovolts or greater, or 9 percent of the amount delivered at less than 44 kilovolts.

NORTHWESTERN PUBLIC SERVICE CO.

The compensation and losses provided for in this agreement for transmission over the company's transmission system in South Dakota, regardless of distance of transmission when interconnection is made at all of five proposed points of delivery, is 1 mill per kilowatt-hour and, for losses, 9 percent of the power and 5 percent of the energy delivered from the company's transmission system.

OTTERTAIL POWER CO.

The compensation and losses provided for in this agreement for transmission over the company's transmission system in North Dakota, regardless of distance when interconnection is made at all of nine proposed points of delivery, is 1 mill per kilowatt-hour and, for losses, 7 percent of the power and energy delivered from the company's transmission system.

MONTANA-DAKOTA UTILITIES CO.

The compensation provided for in this agreement for transmission over the company's transmission system, mostly in Montana and North Dakota, regardless of distance of transmission, is basically 1.069 mills per kilowatt-hour but is subject to a slight increase depending on the relationship of the amount of energy

wheeled to the amount of energy sold to the company for its own use. Due to the level of the charge for transmission service, the company itself absorbs the losses incurred in transmission of power and energy; i. e., the Bureau is not required to furnish power and energy for losses.

Senator MILLIKIN. We do not have to work out a satisfactory wheeling agreement now. That is not involved in this. That has to be negotiated with the Secretary of the Interior if, as, and when; is that not correct?

Mr. PATTERSON. That is correct, sir.

Senator ANDERSON. Do you people not know whether this is in line? I cannot understand how neither the public utility nor the Bureau of Reclamation has any idea whether this is in line with what is being done around the rest of the United States.

Mr. PATTERSON. I think this is generally in line, sir, insofar as I know.

Senator ANDERSON. Do you have any information to indicate that? Do you mean to tell me that neither you nor the Bureau has ever stopped to consider whether this arrangement you now have is in line with what is being charged elsewhere?

Mr. PATTERSON. I have knowledge of several contracts, sir. I have knowledge of the wheeling contract with the Bureau of Reclamation and the company up in Montana, the Montana Power Co. I believe that theirs has the same charge for wheeling service, but a different compensation for losses than ourselves. I believe that the charge is the same as ours.

The contract between the Bureau and the P. G. & E., the Pacific Gas & Electric, I believe is a postage-stamp deal where the wheeling charge is the same anywhere on their system, but the average distance wheeled is comparatively short. So in effect, it is in line with our zone 1. Those are the contracts of which I have some knowledge.

As was mentioned here, there are contracts between other agencies of the Department of the Interior, such as the Southwestern Power Administration. I am not too sure of the details of those. My negotiations have all been with the Bureau of Reclamation.

Senator ANDERSON. I cannot understand why the Bureau of Reclamation or somebody connected with it would not have tried to find out what the practice is around the country. It seems to me that just natural curiosity would tempt them to try to find that out, if nothing else.

I agree with Senator Watkins. I would not like to see these lines built by the Government if a private utility will do it; if the deal is all right. On the other hand, I would not be in favor of striking the authorization out of the bill, because I want them to be able to bargain with you and to bargain freely with you. I think most members of the committee feel the same way. We are not disturbed to put this extra money in this bill and to pass it with the extra money in.

Senator MILLIKIN. Mr. Patterson, you are simply stating the principles that will govern this kind of agreement?

Mr. PATTERSON. That is right, sir.

Senator MILLIKIN. You are not now submitting an actual agreement that you would enter into with the Secretary of the Interior?

Mr. PATTERSON. That is exactly right, sir. We would expect to enter bargaining with them as to what the wheeling charges would be.

Senator JACKSON. Would it be substantially the same as you are operating under at the present time as to your wheeling agreement?

Mr. PATTERSON. I would assume it would be close to that; yes, sir.

Senator JACKSON. That is all I wanted.

Senator MILLIKIN. We have agreed that we will put in the record your present wheeling agreement? Will you submit it and we will put it in the record?

Mr. PATTERSON. All right, sir. I do not have a copy with me.

Senator MILLIKIN. Mail it to us and we will put it in the record.

Senator JACKSON. The Bureau can supply it.

Mr. TOMLINSON. We will be glad to provide you with a copy of that.

Senator MILLIKIN. Get it to us promptly so we can put it in the record.

(The requested information follows:)

Contract No. I81r–1305

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

Colorado-Big Thompson project, Colorado

CONTRACT WITH PUBLIC SERVICE CO. OF COLORADO FOR TRANSMISSION SERVICE

1. This contract, made this 18th day of August 1950, in pursuance of the act of Congress approved June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, between the United States of America, hereinafter called the United States, represented by the officer executing this contract, his duly appointed successor, or his duly authorized representative, hereinafter called the contracting officer, and the Public Service Co. of Colorado, a corporation duly organized, created, and existing under and by virtue of the laws of the State of Colorado, hereinafter called the contractor, its successors and assigns,

Witnesseth:

2. Whereas the United States is constructing the authorized Colorado-Big Thompson project including facilities for the generation and transmission of electric power and energy and is entering into contracts for the marketing of such electric power and energy under existing laws; and

3. Whereas the contractor is engaged in the business of generating, transmitting and distributing electric energy in and to various parts of the State of Colorado; and

4. Whereas the United States and the contractor have entered into contract No. I2r–8662, dated June 28, 1938, and extended by agreement dated May 22, 1950; contract No. I2r–14626 dated April 21, 1943, as amended August 1, 1945, and October 6, 1948; contract No. I81r–1242 dated February 15, 1950; and contract No. I81r–1231 dated February 27, 1950, and extended by agreement dated May 17, 1950, which contracts provide among other things for the sale, purchase, interchange and transmission of electric energy none of which provisions are to be modified hereby; and

5. Whereas it is the mutual desire of the parties hereto that the contractor accept delivery of electric power and energy from the United States into the contractor's electric transmission system at specified points of interconnection and in return, to the extent that the contractor has available excess capacity in said transmission system, that the contractor make delivery of an equivalent amount of electric power and energy (adjusted for losses) to the United States and/or its customers at specified points under the terms and conditions hereinafter set forth; and that the United States accept delivery of electric power and energy from the contractor into the United States' electric transmission system at specified points of interconnection and in return, to the extent that the United States has available excess capacity in said transmission system, that the United States make delivery of an equivalent amount of electric power and energy (adjusted for losses) to the contractor at specified points under the terms and conditions hereinafter provided;

6. Now, therefore, in consideration of the mutual covenants herein set forth, the parties hereto agree as follows:

PART 1—AGREEMENT TO DELIVER ELECTRIC POWER AND ENERGY TO THE UNITED STATES FROM THE CONTRACTOR'S ELECTRIC TRANSMISSION SYSTEM

USE OF CONTRACTOR'S FACILITIES

7. (*a*) The contractor hereby agrees to accept delivery of electric power and energy into its electric transmission system as now or hereafter existing to the extent that the contractor has available excess capacity in said transmission system, not necessary to serve the contractor's customers, as determined by the contractor, and to deliver an equivalent amount of electric power and energy (adjusted for losses) to the United States for its own use, or for the customers of the United States as defined in article 8 (*c*) hereof, at such points as the United States may from time to time designate on the transmission system of the contractor having a nominal voltage of 44,000 volts or higher, except that certain REA cooperatives presently served by the company at certain locations at lower voltages, as shown on schedule A attached hereto, shall be included in this agreement. This agreement shall include the use of all facilities of the contractor, including transforming, switching, contol, and protective equipment, necessary or used in the transmission and delivery of said electric power and energy. In furtherance of this agreement, the contractor will, upon request of the United States or its customers, make the arrangements necessary to permit such connections to the contractor's said transmission system as may be necessary to receive and deliver the electric power and energy of the United States into and from said transmission system pursuant to the terms of this contract.

(*b*) When, because of conditions on the power system of the contractor resulting from causes similar to the type specified in paragraph C of the general power contract provisions attached hereto, the system of the contractor is temporarily unable to supply the requirements of the contractor's customers and in addition to deliver energy required by the United States and/or its customers, necessary curtailment of loads will be effected in a manner that will cause least hardship to the entire area affected, without regard to the party serving the customer. General procedures for effecting necessary curtailment shall be agreed upon in advance by the contracting officer and the contractor.

ELECTRIC ENERGY DELIVERED TO THE CONTRACTOR BY THE UNITED STATES

8. (*a*) The United States, under the terms and conditions stipulated herein, will furnish the electric power and energy required for the United States and/or its customers as 3-phase, alternating current, at a frequency of 60 cycles per second, at the points of interconnection and at nominal delivery voltages as follows:

(i) at the substation of the United States located near Greeley, Colo., at a nominal delivery voltage of 44,000 volts or 110,000 volts, or both;

(ii) at the substation of the United States located near Dillon, Colo., at a nominal delivery voltage of 100,000 volts;

(iii) at such other points of interconnection and voltages as the parties hereto may agree upon in writing.

(b) The electric power and energy will be furnished and delivered to the contractor in such amounts and at such rates of delivery as are from time to time required by the United States and/or its customers, including losses in transmission equal to:

(i) Three percent of the power and the energy delivered by the contractor in zone 1 as defined in article 9 hereof;

(ii) Six percent of the power and the energy delivered by the contractor in zone 2 as defined in article 9 hereof;

(iii) Nine percent of the power and the energy delivered by the contractor in zone 3 as defined in article 9 hereof:

*Provided*, That the electrical load thus added plus the then existing load on the contractor's transmission system will not exceed the normal capacity of the contractor's transmission system. Schedules for deliveries of power and energy to the United States and/or its customers shall be prepared, and changed from time to time as conditions require, by the parties hereto for system operating controls, and deliveries that are inadvertently greater or less than requirements to serve the United States and/or its customers shall be corrected in later deliveries in accordance with schedules agreed upon between the contractor and the contracting officer.

(c) The electric power and energy to be delivered by the contractor to the United States and/or its customers from the transmission system of the contractor

shall be limited to such power and energy as is necessary for the following classes of customers:

(i) Irrigation and drainage district pumping plants;

(ii) Customers entitled to preference under governing laws; and

(iii) Customers engaged in the construction, operation, and/or maintenance of hydraulic projects or hydraulic facilities for the United States.

PAYMENT FOR USE OF CONTRACTOR'S FACILITIES

9. (*a*) The United States will compensate the contractor for the use of its facilities to effectuate the delivery of electric power and energy to the United States and/or the customers of the United States in accordance with the following rates:

For delivery within zone 1, as hereinafter defined, 1 mill per kilowatt-hour.

For delivery within zone 2, as hereinafter defined, 2 mills per kilowatt-hour.

For delivery within zone 3, as hereinafter defined, 3 mills per kilowatt-hour.

This compensation shall be exclusive of energy furnished to cover losses in transmission over the contractor's system.

(*b*) It is understood that the area within zone 1 shall include the area falling within a 50-mile radius from any point of interconnection referred to in article 8 (a). Zone 2 shall include the area falling between a radius of 50 miles and 100 miles from any point of interconnection referred to in article 8 (a). Zone 3 shall include the area falling between a radius of 100 miles and 150 miles from any point of interconnection referred to in article 8 (*a*). Modification of these zones may be made by mutual written agreement between the contractor and the United States.

(*c*) The amount of energy delivered by the contractor to which the above rate applies shall be determined as provided in article 17 (b). The contractor shall render an itemized bill for the amount due hereunder from the United States not later than 10 days after receipt from the United States of the information as to the amounts of energy delivered by the contractor that is required for its preparation, and such bill shall be due and payable as soon after receipt thereof as the necessary vouchers can be prepared.

STANDBY FOR THE UNITED STATES

10. The contractor agrees to deliver to the United States such power and energy as the contractor has available above its own requirements, as determined by the contractor, for the loads of the United States or customers of the United States being served from the transmission system of the contractor in the event of the inability of the United States to supply such electric energy by reason of a failure or reduction of generation at powerplants of the United States or failure of transmission lines of the United States. The electric energy so furnished by the contractor, increased by losses as determined under article 8 (*b*) to cover the contractor's losses in transmission, shall be returned by the United States, kilowatt-hour for kilowatt-hour, at the earliest practicable time and in accordance with schedules to be agreed upon between the contractor and the contracting officer. The United States shall pay the contractor the transmission charge in accordance with the terms of article 9 herein for each kilowatt-hour so furnished by the contractor, exclusive of transmission losses, the same as though the standby service had been energy furnished by the United States for transmission. It is mutually agreed that the standby provided for in this article is to be supplied only during outages or reductions in delivery of power by the United States due to the failure of facilities and not due to inadequacy of water for power generation.

POWER FACTOR

11. The United States and its customers shall maintain a power factor at the points of delivery provided for in article 7 (*a*) hereof of not less than 90 percent lagging; *Provided*, That the United States and its customers will be permitted to operate at a lower power factor when conditions are such, as determined by the contractor, that a lower power factor will not prevent the contractor from making full use of its available generating and transmission facilities.

PART 2—AGREEMENT TO DELIVER ELECTRIC POWER AND ENERGY TO THE CONTRACTOR FROM THE ELECTRIC TRANSMISSION SYSTEM OF THE UNITED STATES

USE OF FACILITIES OF THE UNITED STATES

12. (*a*) The United States hereby agrees to accept delivery of electric power and energy into its electric transmission system as now or hereafter existing to the extent that the United States has available excess capacity in said transmission system, not required for its own use or to serve the customers of the United States, as determined by the contracting officer, and to deliver an equivalent amount of electric power and energy (adjusted for losses) to other portions of the contractor's system at such points on the transmission system of the United States at which the United States has provided substations for the delivery of electric power and energy to the contractor, and such other points as the contracting officer, at his sole discretion, shall authorize. This agreement shall include the use of all facilities of the United States, including transforming, switching, control, and protective equipment, necessary or used in the transmission or delivery of said electric power and energy: *Provided*, That, when and as the contractor is authorized to interconnect its system with that of the United States at any point, the contractor at its own expense shall furnish such equipment and devices, not provided by the United States, as are required in accordance with standards for good utility operating practice.

(*b*) When, because of conditions on the power system of the United States resulting from causes similar to the type specified in paragraph C of the General Power Contract Provisions attached hereto, the system of the United States is temporarily unable to supply the requirements of the United States and/or its customers and in addition to deliver energy required by the contractor, necessary curtailment of loads to the extent permitted by law will be effected in a manner that will cause least hardship to the entire area affected, without regard to the party serving the customer. General procedures for effecting necessary curtailment shall be agreed upon in advance by the contracting officer and the contractor.

ELECTRIC ENERGY DELIVERED TO THE UNITED STATES BY THE CONTRACTOR

13. (*a*) The contractor, under the terms and conditions stipulated herein, will furnish the electric power and energy required by the contractor as 3-phase, alternating current, at a frequency of 60 cycles per second, at the points of interconnection and at nominal delivery voltages as specified in article 8 (*a*) hereof.

(*b*) The electric power and energy will be furnished and delivered to the United States in such amounts and at such rates of delivery as are from time to time required by the contractor, including losses in transmission equal to:

(i) Three percent of the power and the energy delivered by the United States in zone 1 as defined in article 9 hereof;

(ii) Six percent of the power and the energy delivered by the United States in zone 2 as defined in article 9 hereof;

(iii) Nine percent of the power and the energy delivered by the United States in zone 3 as defined in article 9 hereof;

*Provided*, That the electrical load thus added plus the then existing load on the transmission system of the United States will not exceed the nominal capacity of the transmission system of the United States. The electric power and energy so delivered to the United States will be delivered from the system of the United States to the contractor at the point or points of delivery at the stepdown voltage available at the substation of the United States at which the circuits of the contractor are attached, or at transmission voltage if the contracting officer, at his discretion shall so authorize.

(*c*) The United States shall endeavor to so operate its system, to the extent consistent with its other obligations, as to permit the receipt from the contractor and delivery to the contractor of the electric power and energy in the amounts and between the points that the contractor desires in accordance with schedules prepared by the parties hereto. To the extent that the contractor delivers electric energy into the system of the United States in amounts which, when reduced by transmission losses, are greater or less than the amounts received from the transmission system of the United States by the contractor, such discrepancies shall be corrected in later deliveries in accordance with schedules agreed upon between the contractor and the contracting officer.

COMPENSATION TO THE UNITED STATES

14. The contractor will compensate the United States for the use of its facilities to effectuate the delivery of electric power and energy to the contractor in accordance with the rates and zones established in article 9 hereof. This compensation shall be exclusive of the energy furnished to cover losses in transmission over the system of the United States. The amount of energy delivered by the United States to which the above-mentioned rates apply shall be determined as provided in article 17 (*c*) and payment therefor shall be made in the manner provided in paragraph G of the General Power Contract Provisions attached hereto.

STANDBY FOR THE CONTRACTOR

15. The United States agrees to deliver to the contractor such power and energy as the United States has available above its own requirements, as determined by the United States, for loads of the contractor or customers of the contractor being served from the transmission system of the United States in the event of the inability of the contractor to supply such electric energy by reason of a failure or reduction of generation at power plants of the contractor or failure of transmission lines of the contractor. The electric energy so furnished by the United States, increased by losses as determined under article 13 (*b*) to cover the United States losses in transmission, shall be returned by the contractor, kilowatt-hour for kilowatt-hour, at the earliest practicable time and in accordance with schedules to be agreed upon between the United States and the contractor. The contractor shall pay the United States the transmission charge in accordance with terms of article 14 hereof for each kilowatt-hour so furnished by the United States, exclusive of transmission losses, the same as though the standby service had been energy furnished by the contractor for transmission.

POWER FACTOR

16. The contractor shall maintain a power factor at the points of delivery provided for in article 12 (*a*) hereof of not less than 90 percent lagging: *Provided*, That the contractor will be permitted to operate at a lower power factor when conditions are such, as determined by the United States, that a lower power factor will not prevent the United States from making full use of its available generating and transmission facilities.

## PART 3—GENERAL PROVISIONS

MEASUREMENT OF ELECTRIC POWER AND ENERGY

17. (*a*) The United States will provide and maintain metering equipment of a recording type to measure the electric power and energy furnished to the contractor or received from the contractor at the points of interconnection and at the nominal delivery voltages specified in article 8 (*a*) hereof. The United States agrees to read all meters on the last day of each billing period and at such other times as may be required under the operation of this contract and to submit a copy of all readings to the contractor for its records. The United States will service and maintain recording charts on all meters, and will make such charts available to the contractor upon request.

(*b*) With respect to the electric power and energy delivered by the contractor to the United States or to its customers pursuant to part 1 hereof:

(i) Such electric power and energy shall be measured at the voltage of the transmission line from which it is delivered to the United States or its customers at or near the points of delivery of such electric power and energy, by metering equipment of a recording type to be furnished and maintained by the United States: *Provided*, That such power and energy delivered at any point or points of delivery may, at the option of the United States, be measured on the low-voltage side of substations at or near said point of delivery, in which event the meter readings at said point of delivery will be increased by 2 percent in order to compensate for transformer losses, except that if the metering equipment automatically adjusts for transformer losses, the actual readings thus adjusted shall be used: *Provided further*, That, if such power and energy delivered at any point of delivery is transmitted an appreciable distance before it is measured, the meter readings at said point of delivery will be increased by an amount to be agreed upon in writing by the parties hereto in order to compensate for transmission losses between the

point of delivery and the point of measurement, except where the metering equipment automatically adjusts for such losses.

(ii) The United States agrees to read all meters on the last day of each billing period and as required at other times in connection with standby service provided hereunder, and to submit a copy of all readings to the contractor for its records. The United States will service and maintain recording charts on all meters, and will make such charts available to the contractor on request.

(iii) The amount of standby electric energy supplied by the contractor for the loads of the United States or its customers pursuant to article 10 will be determined as in subsection (*b*) (i) above or in the absence of proper meter readings, from the best information available.

(iv) The determinations resulting from measurement of electric power and energy referred to herein will be modified as the result of the return of standby energy, adjustments for corrections in deliveries for transmission, deliveries over the facilities of the United States from other power sources, or extraordinary conditions, as appropriate.

(*c*) With respect to the electric power and energy delivered by the United States to the contractor pursuant to part 2 hereof:

(i) Such electric power and energy shall be measured at the voltage of the transmission line from which it is delivered to the contractor at or near the points of delivery of such electric power and energy, by metering equipment of a recording type to be furnished and maintained by the contractor: *Provided*, That such power and energy delivered at any point or points of delivery may, at the option of the contractor, be measured on the low-voltage side of substations at or near said point of delivery, in which event the meter readings at said point of delivery will be increased by 2 percent in order to compensate for transformer losses, except that if the metering equipment automatically adjusts for transformer losses, the actual readings thus adjusted shall be used: *Provided further*, If such power and energy delivered at any point of delivery is transmitted an appreciable distance before it is measured, the meter readings at said point of delivery will be increased by an amount to be agreed upon in writing by the parties hereto in order to compensate for transmission losses between the point of delivery and the point of measurement, except where the metering equipment automatically adjusts for such losses.

(ii) The contractor agrees to read all meters on the last day of each billing period and as required at other times in connection with standby service provided hereunder, and to submit a copy of readings to the United States for its records. The contractor will service and maintain recording charts on all meters, and will make such charts available to the United States on request.

(iii) The amount of standby electric energy supplied by the United States for the loads of the contractor or its customers pursuant to article 15 will be determined as in subsection (*c*) (i) above or, in the absence of proper meter readings, from the best information available.

(iv) The determinations resulting from measurement of electric power and energy referred to herein will be modified as the result of the return of standby energy, adjustments for corrections in deliveries for transmission, deliveries over the facilities of the contractor from other power sources, or extraordinary conditions, as appropriate.

(*d*) The meters shall be sealed and the seals shall be broken only upon occasions when the meters are to be inspected, tested, or adjusted, and representatives of the contractor and the contracting officer shall be afforded reasonable opportunity to be present upon such occasions. The meters shall be tested at least once each year and at any reasonable time upon request therefor by either party hereto. Any metering equipment found to be defective or inaccurate shall be repaired and readjusted or replaced. Should any meter fail to register, the electric power and energy delivered hereunder during such period of failure to register shall, for billing purposes, be estimated from the best information available.

CONTROL AND MAINTENANCE OF CONTRACTOR'S TRANSMISSION SYSTEM

18. (*a*) The electric transmission system of the contractor shall at all times be and remain in the exclusive possession and control of the contractor and this agreement shall not be construed to grant to the United States any rights of ownership in or possession of said electric transmission system. The contractor

shall operate and maintain said electric transmission system in good and satisfactory operating condition.

(*b*) The United States will install, maintain and operate, or will require its customers, as defined in article 8 (*c*), to install, maintain, and operate, such proper service protective equipment as up-to-date electrical engineering practices recognize as necessary and efficient for the purpose of clearing and protecting the contractor's electric transmission system of the faults, grounds, and other types of electrical disturbances that originate upon the power systems of the United States or its customers.

CONTROL AND MAINTENANCE OF TRANSMISSION SYSTEM OF THE UNITED STATES

19. (*a*) The electric transmission system of the United States shall at all times be and remain in the exclusive possession and control of the United States and this agreement shall not be construed to grant to the contractor any rights of ownership in or possession of said electric transmission system. The United States shall operate and maintain said electric transmission system in good and satisfactory operating condition.

(*b*) The contractor will install, maintain and operate such proper service protective equipment as up-to-date electrical engineering practices recognize as necessary and efficient for the purpose of clearing and protecting the transmission system of the United States from the faults, grounds, and other types of electrical disturbances that originate upon the contractor's power system.

TERMINATION OF CONTRACTS

20. The contractor has entered into and may in the future enter into contracts for the sale of electric service to such classes of customers, as are referred to in article 8 (*c*) hereof, to which the contractor has agreed to deliver electric power and energy for the United States under the provisions of article 7 hereof. It is agreed that the United States may at its option enter into arrangements or contracts for the provision or sale of electric service for any or all of such loads where the contract of such customers with the contractor has expired or will expire within 2 years. The contractor agrees that whenever it shall receive notice from the United States that the United States has made arrangements or contracts for the provision or sale of electric service for any such loads such notice to specify the approximate date the United States will initially supply service, which date shall be not less than 30 days subsequent to the date of the notice, it will terminate its contract as of the date of initial service by the United States and furnish the United States with a duly authenticated copy of the instrument of termination: *Provided*, That the contractor shall be under no obligation to terminate the contract until and unless the purchaser therein has become current with respect to its obligations thereunder.

EQUIPMENT TO BE SOLD BY THE CONTRACTOR TO THE UNITED STATES

21. The United States agrees to purchase and the contractor agrees to sell and convey to the United States such parts of the contractor's installed metering equipment utilized in serving any customer whose contract is terminated under the terms of article 20, which the United States determines is necessary for metering power and energy delivered for the United States to such customer. Any equipment so purchased will be transferred to the United States at the time that the contractor terminates its contract for the sale of electric service to the load of the United States or to the prospective customer of the United States. Payment for said equipment will be in the amount of its original cost, less depreciation at 3½ percent per annum straight line basis, and will be made by the United States as soon after transfer of the equipment and receipt of an itemized bill therefor as the necessary vouchers can be prepared.

LICENSE TO THE UNITED STATES TO INSTALL AND OPERATE FACILITIES

22. The contractor, upon request from time to time by the contracting officer, will grant to the United States a license or licenses to construct, install, operate, maintain, replace, or repair, either or all, upon the property of the contractor such facilities as in the opinion of the contractor are necessary or desirable for the purposes of this contract. The license or licenses so granted shall be in form and of legal sufficiency acceptable to the contracting officer, shall be and remain in effect during the term of this contract, and shall expire coincidently therewith.

Any facilities so installed by the United States pursuant to said license or licenses shall be and remain the property of the United States notwithstanding that the same may have been affixed to the premises, and the United States shall have a reasonable time after the expiration of said license or licenses in which to remove its facilities so installed.

LICENSE TO THE CONTRACTOR TO INSTALL AND OPERATE FACILITIES

23. The United States hereby grants the contractor a license to construct, install, operate, maintain, replace or repair, either or all, upon property of the United States under the administrative control and jurisdiction of the Bureau of Reclamation such facilities as in the opinion of the contracting officer are necessary or desirable for the purposes of this contract. Said license shall remain in effect during the term of this contract and shall expire coincidently therewith. Any facilities so installed by the contractor pursuant hereto shall be and remain the property of the contractor, notwithstanding that the same may have been affixed to the premises, and the contractor shall have a reasonable time after the expiration of said license in which to remove its facilities so installed.

TERM OF CONTRACT

24. This contract shall become effective upon the date of its execution and, except as otherwise expressly provided for elsewhere in this contract, shall remain in effect until midnight of December 31, 1960.

LIABILITY

25. The contractor, its officers, agents, and employees, or any of them, shall not be liable for any claim for injuries or damages arising from the construction, operation, and maintenance of the facilities of the United States under this contract, unless such claim shall arise out of or result from their negligent act or acts. The United States, its officers, agents, and employees, or any of them, shall not be liable for any claims, demands, costs, losses, causes of action, damages, or liability of whatsoever kind or nature, arising out of or resulting from the construction, operation, and maintenance of the facilities of the contractor under this contract.

RULES AND REGULATIONS

26. The United States and the contractor shall mutually agree upon and put into effect from time to time, such rules and regulations as may be required in order to establish the methods of operation to be followed in the performance of this contract.

CANCELLATION OF CONTRACT

27. If at any time during the term hereof as a consequence of this agreement or the carrying out of any of the terms thereof the contractor shall become subject to any Federal jurisdiction, regulation, control or agency, or in the event any Federal commission, board or other regulatory authority shall assert, or attempt to assert, the existence of any such jurisdiction over the contractor, then and in that event, the contractor shall have the right and option to cancel this contract on 30 days' prior written notice to the United States.

GENERAL POWER CONTRACT PROVISIONS

28. The general power contract provisions attached hereto are hereby made a part of this contract the same as if they had been expressly set forth herein: *Provided*, That provisions B, D, F, I, J, K, M, and Q thereof shall be inoperative for the purposes of this contract.

In witness whereof, the parties hereto have caused this contract to be executed the day and year first above written.

THE UNITED STATES OF AMERICA,
By AVERY A. BATSON,
*Director, Region 7, Bureau of Reclamation, New Customhouse, Denver 2, Colo.*

PUBLIC SERVICE CO. OF COLORADO,
By J. E. LOISEAU, *President, Denver, Colo.*

[CORPORATE SEAL]
Attest:

E. F. NUSSBAUM, *Assistant Secretary.*

CERTIFICATE

I, E. F. Nussbaum, certify that I am an assistant secretary of the Public Service Company of Colorado, the corporation named as contractor herein; that J. E. Loiseau, who signed the above contract on behalf of said contractor, was then its president; that said contract was duly signed for and in behalf of said contractor by authority of its governing body and is within the scope of its corporate powers.

[CORPORATE SEAL] E. F. NUSSBAUM.

Approved for execution.

LEE, BRYANS, KELLY & STANSFIELD,
By W. A. B.

SCHEDULE A

| Name of REA | Location of point of service | Voltages at which service is furnished |
|---|---|---|
| Zone 1: | | *Kilovolt* |
| Intermountain REA | Strasburg | 13 |
| Do | Future boulevard, near Denver | 13 |
| Do | Fairplay | 13 |
| Holy Cross REA | Minturn | 13 |
| Zone 2: | | |
| Holy Cross REA | Rifle | 13 |
| Sangre de Cristo REA | Salida | 16.5 |
| Zone 3: | | |
| San Luis Valley REA | San Luis | [1] 6.9 |
| Grand Valley REA | DeBeque | [2] 12.5 |
| Do | Fruitvale | 11 |
| Do | Fruita | 11 |
| San Luis Valley REA | Zinzer Switch | 22 |

[1] Single-phase service without transformation.
[2] Three-phase service without transformation.

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

Effective January 17, 1950

GENERAL POWER CONTRACT PROVISIONS

*A. Characteristics of power and energy*

Electric energy supplied hereunder will be 3-phase, alternating current, at a nominal frequency of 60 cycles per second.

*B. Delivery of energy in excess of contract obligation*

The contractor may from time to time, in the absence of objection by the contracting officer, use energy at rates greater than the contract rate of delivery in effect for each type of service provided for in this contract, but such greater use shall not be deemed to establish in the contractor any right thereto and the contractor shall cease any such greater use whenever and for the periods of time requested by the contracting officer.

*C. Continuity of electric service to be furnished*

The electric service, unless otherwise specified, will be furnished continuously except (1) for interruptions or reductions due to uncontrollable forces, as defined herein; (2) for interruptions or reductions due to operation of devices installed for power protection; and (3) for temporary interruptions or reductions, which, in the opinion of the contracting officer, are necessary or desirable for the purposes of maintenance, repairs, replacements, installation of equipment, or investigation and inspection. The United States, except in case of emergency as determined by the contracting officer, will give the contractor reasonable advance notice of such temporary interruptions or reductions and will remove the cause thereof with diligence.

*D. Multiple points of delivery*

When electric service is furnished at two or more points of delivery under the same schedule of rates, said schedule of rates shall apply separately to the service supplied at each point of delivery.

*E. Uncontrollable forces*

Neither party shall be considered to be in default in respect to any obligation hereunder, if prevented from fulfilling such obligation by reason of uncontrollable forces, the term "uncontrollable forces" being deemed for the purpose of this contract to mean any cause beyond the control of the party affected, including, but not limited to, inadequacy of water for the generation of the electric power and energy herein contracted for as conclusively determined by the Secretary of the Interior, failure of facilities, flood, earthquake, storm, lightning, fire, epidemic, war, riot, civil disturbance, labor disturbance, sabotage, and restraint by court or public authority, which by exercise of due diligence and foresight such party could not reasonably have been expected to avoid. Either party rendered unable to fulfill any obligation by reason of uncontrollable forces shall exercise due diligence to remove such inability with all reasonable dispatch.

*F. Modification of rates*

The rate schedule specified in this contract shall be subject to successive modification by the United States through the promulgation of superseding rate schedules. If at any time the United States promulgates a rate schedule superseding the rate schedule then in effect under this contract, it will promptly notify the contractor thereof. Said superseding rate schedule, as of its effective date, shall become effective as to this contract unless the contractor, by notice in writing given to the contracting officer within 60 days after notice to it by the United States of promulgation of said superseding rate schedule, shall elect to terminate this contract effective as of such date not more than 3 years subsequent thereto as the contractor shall therein specify. In the event of such termination, said superseding rate schedule shall not be effective during the period of the remaining unexpired term of this contract or during a period of 2 years from the date of notice to the contractor of the promulgation of said superseding rate schedule, whichever period is the shorter.

*G. Billings and payments*

The United States will submit bills to the contractor on or before the tenth day of each month for electric service furnished during the preceding month, and payments will be due and payable by the contractor on the first day of the month immediately succeeding the date each bill is submitted.

*H. Nonpayment of bills*

If the contractor fails to pay any bill when due an interest charge of 1 percent of the amount unpaid shall be added thereto as liquidated damages, and thereafter, as further liquidated damages, an additional interest charge of one-half of 1 percent of the principal sum unpaid shall be added on the first day of each succeeding calendar month until the amount due, including interest, is paid in full. The United States shall have the right upon not less than 15 days' advance written notice to discontinue furnishing electric service to the contractor for nonpayment of bills and to refuse to resume same so long as any part of the amount due remains unpaid. Such a discontinuance of electric service will not relieve the contractor of liability for the minimum charge during the time electric service is so discontinued. The rights given herein to the United States shall be in addition to all other remedies available to the United States, either at law or in equity, for the breach of any of the provisions hereof.

*I. Adjustments for fractional billing period*

(*a*) For a fractional part of a billing period at the beginning or end of service, and for fractional periods due to withdrawals of service, the demand charge, the kilowatt-hour blocks of the energy charge, and the minimum bill shall each be proportionately adjusted in the ratio that the number of hours that electric service is furnished to the contractor in such fractional billing period bears to the total number of hours in the billing period involved.

(*b*) Whenever irrigation and/or drainage pumping service is supplied under this contract, adjustments in the demand charge and in the kilowatt-hour blocks of the energy charge as applicable, and in the minimum charge of the rate schedule under which service is supplied, shall be made for the fractional part of the billing period at the beginning and end of pumping service in each year in like manner as is provided for in section (*a*) of this article. If pumping service is supplied in conjunction with service for other purposes and is not metered separately, the billing demand for pumping service shall be considered to be the difference between the highest 30-minute integrated demand measured during the billing period and the contract rate of delivery for firm power.

*J. Adjustments for interruptions to service*

Should the delivery of electric energy be interrupted or curtailed because of conditions on the power system of the United States, which system for purpose of adjustments hereunder shall include transmission facilities utilized but not owned by the United States, below the contract rate of delivery for the affected type of service provided for in this contract or below the rate of delivery required by the contractor at the time of such reduction, whichever is the lesser, for a period or periods of 1 hour or longer in duration each, the total number of hours of curtailed service in any billing period shall be determined by adding the sum of the number of hours of interrupted service to the product of the number of hours of reduced service multiplied by the percentage of said reduction below said contract rate of delivery or below the rate of delivery required by the contractor at the time of such reduction, whichever is the lesser. The demand charge, the kilowatt-hour blocks of the energy charge, and the minimum bill shall each be proportionately adjusted in the ratio that the total number of hours of such curtailed service as herein determined bears to the total number of hours in the billing period involved. The contractor shall make written claim, within 30 days after receiving the monthly bill, for adjustment on account of any curtailment to service, for a period or periods of 1 hour or longer in duration each, alleged to have occurred and which is not reflected in such bill. Failure to make such written claim, within said 30-day period, shall constitute a waiver thereof. All curtailments to service, for any reason whatsoever, which are due to conditions on the power system of the United States, shall be subject to the provisions of this article and the contractor shall be limited in its remedy to the relief granted by this article.

*K. Measurement of electric power and energy*

The total electric power and energy delivered to the contractor will be measured by metering equipment to be furnished and maintained by the United States The meter or meters shall be sealed and the seals shall be broken only upon occasions when the meters are to be inspected, tested, or adjusted, and representatives of the contractor shall be afforded reasonable opportunity to be present upon such occasions. The meter or meters shall be tested at least once each year by the United States and at any reasonable time upon request therefor by either party. Any metering equipment found to be defective or inaccurate shall be repaired and readjusted or replaced. Should any meter fail to register, the electric power and energy delivered during such period of failure to register shall, for billing purposes, be estimated by the contracting officer from the best information available.

*L. Corrections for inaccurate meters*

If any of the meter tests provided for herein discloses that the error of any meter or meters exceeds 2 percent, correction based upon the inaccuracy found shall be made of the records of electric service furnished since the beginning of the monthly billing period immediately preceding the billing period during which the test was made: *Provided*, That no correction shall be made for a longer period than such inaccuracy may be determined by the contracting officer to have existed. Any correction in billing resulting from such correction in meter records shall be made in the next monthly bill rendered by the United States to the contractor, and such correction when made shall constitute full adjustment of any claim between the parties hereto arising out of such inaccuracy of meters.

*M. Power factor*

While the contractor will normally be required to maintain the power factor as stated in the rate schedule then in effect under this contract, the contractor will be permitted to operate at a lower power factor when conditions are such, as determined by the contracting officer, that a lower power factor will not prevent the United States from making full use of its available generating and transmission facilities.

*N. Cooperation of contracting parties*

(*a*) If, in the maintenance of their respective power systems and/or electrical equipment and the utilization thereof for the purposes of this contract, it becomes necessary by reason of any emergency or extraordinary condition for either party to request the other to furnish personnel, materials, tools, and equipment for the accomplishment thereof, the party so requested shall cooperate with the other and render such assistance as the party so requested may determine to be available. The party making such request, upon receipt of properly itemized bills from the

other party, shall reimburse the party rendering such assistance for all costs properly and reasonably incurred by it in such performance, including not to exceed 10 percent thereof for administrative and general expenses, such costs to be determined on the basis of current charges or rates used in its own operations by the party rendering assistance.

(*b*) No laborer or mechanic, in the employ of the contractor, doing any part of the work contemplated by this article, shall be required or permitted to work more than 8 hours in any 1 calendar day upon such work at the site thereof, except upon the condition that compensation is paid to such laborer or mechanic in accordance with the provisions of this article. The wages of every laborer and mechanic employed by the contractor in the performance of any part of the work contemplated by this article shall be computed on a basic day rate of 8 hours per day and work in excess of 8 hours per day is permitted only upon the condition that every such laborer and mechanic shall be compensated for all hours worked in excess of 8 hours per day at not less than 1½ times the basic rate of pay. For each violation of the requirements of this article a penalty of $5 shall be imposed upon the contractor for each laborer or mechanic for every calendar day in which such employee is required or permitted to labor more than 8 hours upon said work without receiving compensation computed in accordance with this article, and all penalties thus imposed shall be withheld for the use and benefit of the United States; *Provided*, That this stipulation shall be subject in all respects to the exceptions and provisions of United States Code, title 40, sections 321, 324, 325, 325a, and 326 relating to hours of labor and to compensation for overtime.

*O. Provisions relative to employment*

(*a*) The contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts; *Provided, however*, That this clause does not refer to, extend to or cover the business or activities of the contractor which are not related to or involved in the performance of any part of the work contemplated by this contract.

(*b*) In the performance of any part of the work contemplated by this contract, the contractor shall not employ any person undergoing sentence of imprisonment at hard labor.

*P. Transfer of interest in contract by contractor*

No voluntary transfer of this contract or of the rights of the contractor hereunder shall be made without the written approval of the Secretary of the Interior; *Provided*, That if the contractor operates a project financed in whole or in part by the Rural Electrification Administration the contractor may transfer or assign its interest in the contract to the Rural Electrification Administration or any other department or agency of the Federal Government without such written approval: *Provided further*, That any successor to or assignee of the rights of the contractor, whether by voluntary transfer, judicial sale, foreclosure sale, or otherwise, shall be subject to all the provisions and conditions of this contract to the same extent as though such successor or assignee were the original contractor hereunder; and, *Provided further*, That the execution of a mortgage or trust deed, or judicial or foreclosure sales made thereunder, shall not be deemed voluntary transfers within the meaning of this article.

*Q. Assignment of industrial contract by the United States*

When the contractor hereunder is denominated an industrial customer, the United States may transfer and assign this contract at any time without the consent of the contractor to any public body or cooperative engaged in the business of distributing electric power and energy purchased at wholesale from the United States, if such assignee agrees to take over and assume all the rights, duties, and obligations of the United States under this contract. Whenever a transfer or assignment of this contract is made by the United States to a public body or cooperative pursuant hereto, such transfer or assignment shall be and constitute a novation and thereafter the United States shall be relieved of all liability under said contract and under said assignment and the contractor shall look solely to the assignee for performance of this contract.

*R. Contract subject to Colorado River compact*

Where the energy sold hereunder is generated from waters of the Colorado River system, this contract is made upon the express condition and with the express covenant that all rights hereunder shall be subject to and controlled by

the Colorado River compact approved by section 13 (a) of the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057) and the parties hereto shall observe and be subject to and controlled by said Colorado River compact in the construction, management, and operation of the dams, reservoirs, and powerplants from which electrical energy is to be furnished by the United States to the contractor hereunder, and in the storage, diversion, delivery, and use of water for the generation of electrical energy to be delivered by the United States to the contractor hereunder.

*S. Waivers*

Any waiver at any time by either party hereto of its rights with respect to a default or any other matter arising in connection with this contract shall not be deemed to be a waiver with respect to any subsequent default or matter.

*T. Notices*

Any notice, demand, or request required or authorized by this contract shall be deemed properly given if mailed, postage prepaid, to the contracting officer at the address shown on the signature page hereof, on behalf of the United States, except where otherwise herein specifically provided, and to the officer signing for the contractor at the address shown on the signature page hereof, on behalf of the contractor. The designation of the person to be notified or the address of such person may be changed at any time by simular notice.

*U. Contingent upon appropriations*

Where the operations of this contract extend beyond the current fiscal year, the contract is made contingent upon Congress making the necessary appropriation for expenditures hereunder after such current year shall have expired. In case such appropriation as may be necessary to carry out this contract is not made, the contractor hereby releases the United States from all liability due to the failure of Congress to make such appropriation.

*V. Officials not to benefit*

No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this contract if made with a corporation or company for its general benefit.

*W. Covenant against contingent fees*

The contractor warrants that it has not employed any person to solicit or secure this contract upon any agreement for a commission, percentage, brokerage, or contingent fee. Breach of this warranty shall give the United States the right to annul the contract or, in its discretion, to deduct from the contract price or consideration the amount of such commission, percentage, brokerage, or contingent fees. This warranty shall not apply to commissions payable by contractors upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business.

UNITED STATES DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
REGIONAL OFFICE, REGION 7,
*Denver 2, Colo., July 6, 1950.*

Mr. M. M. KOCH,
*Vice President, Public Service Co. of Colorado,*
*Gas and Electric Building, Denver, Colo.*

DEAR MR. KOCH: Please refer to Mr. Loiseau's letter of June 23, 1950, transmitting to this office two signed copies of the proposed contract between the company and the Bureau providing for transmission service.

Schedule A which is attached to the proposed contract lists certain existing delivery points at which the company will furnish transmission service to certain REA projects at specified voltages lower than 44 kilovolts. We understand that 3 REA projects have each requested electric service from the company at an additional delivery point at voltages less than 44 kilovolts and that negotiations for electric service at the additional points have been underway for some time and are progressing satisfactorily. The additional points are as follows:

| Name of REA | Location of point of service | Voltage at which service is to be furnished |
|---|---|---|
| | | *Kilovolts* |
| Zone 1: Sangre de Cristo REA | Malta | 13 |
| Zone 2: Holy Cross REA | Glenwood Springs. | 13 |
| Zone 3: Grand Valley REA | Orchard Mesa. | 22 |

We understand the company is willing to furnish transmission service at the above points and voltages the same as though such points had been set forth in schedule A. If our understanding in the matter is correct, will you please confirm in the space indicated below?

Very truly yours.

E. V. LINDSETH, *Acting Director.*

(In duplicate.)
Accepted: M. M. Koch.
Title: Vice president.
Date: July 7, 1950.

Senator JACKSON. In that connection, Mr. Chairman, I think it might be well if they include a copy of their wheeling agreement and then a statement as to a comparison of the rates charged by the Colorado Public Service Co.——

Mr. PATTERSON. The Public Service Co. of Colorado, sir.

Senator JACKSON. As compared with the other agreements.

Mr. TOMLINSON. We will be glad to. I am sorry we did not have one of our power people here.

Senator JACKSON. I think it should be a fair analysis. They have a longer haul in Colorado than you would have in certain other marketing areas. We should have a fair analysis of what they are actually serving.

Mr. PATTERSON. We operate through some rough areas out there, sir, in the mountains.

Senator JACKSON. Those things all ought to be considered. You cannot just look at a cold agreement and say one is cheaper than the other; you have to know what the cost factors are there.

Senator WATKINS. Mr. Patterson, I assume in making this statement to the committee today you are indicating your willingness to enter into a general arrangement to take over the transmission and distribution job for this project.

Mr. PATTERSON. That is right, sir.

Senator WATKINS. That, of course, would help us to determine whether or not in the legislation, in addition to authorizing an appropriation for construction of the transmission lines, it also would enable us to write in our legislation to permit a suitable contract to be procurred with you and even to state a preference in the bill itself.

Senator JACKSON. The existing law I think covers that in the preference clause.

Senator WATKINS. I understand when it comes to preference that that is in the law. A project that takes in the municipalities, the REA's and others who are given preference, is in the Reclamation Act.

Calling your attention to your statement on page 9, paragraph F:

In the event the preference customers in subsequent years require firm power and energy in excess of that supplied from the project or if standby other than

that provided in paragraph E above is required or desired, the companies agree to supply these requirements from their own generating facilities at wholesale rates approved by the Public Utilities Commission of Colorado.

That seems to take care of practically the future situation, provided it means this: That if you do not have in your existing plants enough energy to take care of the expansion of these preferred customers, the REA's and the municipalities, then what? Are you willing now to say that you would put in it these facilities to take care of that expansion on the same kinds of deal?

Mr. PATTERSON. I would say, sir, that it is the general policy of our company to build our generating facilities in advance of need. As I mentioned, I do not know whether you were here or not, sir, but we have doubled our generating capacity since the end of the war.

Senator WATKINS. Yes, I heard that.

Mr. PATTERSON. We have under construction at the present time 3 steam generating units totaling 176,000 kilowatts. I am sure that the management of the company proposes to keep on adding generating units as long as there is any evidences of growth in load, because as long as we meet our customers' needs, we feel that our relations with our customers will be good. When you stop meeting your customers' needs, that is when your relations become bad.

Senator WATKINS. I like that statement. Assuming also that the upper Colorado storage projects, powerplants, are all built, that includes a very large program. There may be some power sent from the east side as they send the water over.

Mr. PATTERSON. That is right, sir.

Senator WATKINS. Are you prepared to say now that you would take care of that on substantially the same terms, too?

Mr. PATTERSON. We would surely take a look at it.

Senator WATKINS. It is easy to say that.

Senator MILLIKIN. You are jumping pretty far, Senator.

Senator WATKINS. I am not jumping too far, because I hope that the upper Colorado storage is not going to be very far behind this project. It is all right before this committee, and we have to find out about the power that is to be developed there. I know in my own State some of the utilities indicate they can take care of all the power needs, that there is no shortage of power, and that they can take care of it as fast as industry grows.

I note in your case you seem to have quite a different attitude from what I have noticed in my own State. If we build all of those dams on the upper Colorado, we are going to produce an immense amount of power. That could easily go over the mountain.

Mr. PATTERSON. I would just like to say this in that connection: We are looking ahead, obviously, and our plans for our system contemplate adding steam units. We are buying powerplant property in advance of need, but steam units can be added as required. Approximately 3 years from the date that you place the order you can have a unit on the line and in operation. That means that even though we have in mind adding a unit, say in 1957 or 1958, and you come along with a hydro unit that is going to go in operation in advance of that, we do not have to go ahead and order that unit. We can wait and use the hydro as it becomes available.

In other words, hydroelectric power is a natural resource that none of us wants to see go to waste. We can add the steam as it may be needed in the system.

Senator WATKINS. Of course, as a matter of fact, from what you outlined on the chart, you will be operating on the west slope as well?

Mr. PATTERSON. That is right.

Senator WATKINS. You are already operating there?

Mr. PATTERSON. That is right, we are, sir.

Senator MILLIKIN. The principles that you have mentioned here for a contract of that kind—are you speaking for the Colorado zone?

Mr. PATTERSON. Yes, sir, that is right.

Senator MILLIKIN. What is the official name of that company?

Mr. PATTERSON. Souther Colorado Power Co.

Senator MILLIKIN. You are speaking for that company?

Mr. PATTERSON. Yes, sir, that is right. Our statement which we introduced in the record is signed by the presidents of both organizations. They are very familiar with everything that is in here.

We contemplate building a second transmission circuit from Leadville down to Salida and a double circuit from Salida eastward to hook up with the system of the Southern Colorado Power Co., and then they are constructing a 115-kilovolt circuit at the present time between Canon City——

Senator JACKSON. What is the voltage on the circuit that you are going to build from up above there?

Mr. PATTERSON. From Leadville down to Salida. That will be 115,000 volts. That is the standard transmission voltage on our system. With the construction of the double circuits throughout the valley, that will insure that the service will be of the very highest quality. We think the proposal which we have here is worthy of your consideration in that it reduces the amount of money that the Federal Government would have to invest in the project. It will reduce the annual operation and maintenance expense of the project. It will give the most widespread distribution of the energy, since our systems do embrace a large part of the State. It will place the additional transmission lines which we construct on the tax rolls to help our school districts and our counties and towns and all other units of Government which levy ad valorem taxes. It will help them. It will have our steam system behind the hydrosystem to back it up and to render the very best service that the people can obtain.

I believe, sir, that we have here a proposal worthy of your consideration.

We are not people who know how to draft any legislation. We have no legislation to submit to you. But we hope that you will look favorably upon this and perhaps in the report which your committee makes you can recommend that the Department of the Interior endeavor to negotiate satisfactory contracts with us and that they not construct transmission lines until after they have tried to negotiate with us.

Senator MILLIKIN. I think that could be handled, perhaps not in exactly the way that you state, but the idea I think could be covered in the report.

Mr. PATTERSON. We thank you so much.

Senator MILLIKIN. I am speaking only for myself because I am authorized to speak only for myself. Let me congratulate these companies for the very farsighted, constructive suggestions that you have made and for the clarity of your own presentation.

Mr. PATTERSON. I thank you, sir, very much.

Senator WATKINS. I would like to join the Senator in that.

Senator ANDERSON. I wanted to say I want to congratulate him for sitting here and openly saying that he hoped to be able to negotiate this thing with these people. I think that is the way to go at it. I believe if you continue to go at it that way, you will find that they will negotiate with you. I think it would be a good result.

Senator JACKSON. Coming from a great public power State, I will say for the record I think you have been a very fair and forthright witness. I think the private utilities would not have a lot of troubles that they have had in the past few years if they had always looked to the future with a little more optimism instead of pessimism. You know, it is said time and time again that the Federal Government is following policies that will result in the nationalization of our power industries. I know that you as a fairminded citizen certainly believe that that is not true.

In my State, back in 1929, with a very conservative legislature, they voted in the Public Utilities District Act. Subsequently, under our referendum law, referring it to the people, the people of the State of Washington in 1930 voted to set up the public utility district law and confirmed the action of the legislature.

I will say that was at a time when probably there were not more than 5 percent of the legislature were Democrats, and the rest was Republican. That was before we had a Federal project.

I also would like to point out that the only State in the Union where you do not have a single private utility today is the State of Nebraska. There was not a single Federal power project in the State when that happened.

I personally believe that there is room for both public and private power. I would hate to see all of any one thing happen. I think we need both in the distribution of our power. If your company goes about your business in an intelligent way, keeping on their toes and providing good service at a low rate, you do not have anything to fear.

I merely make that observation, Mr. Chairman, because this is one subject that you can get into a lot of demagoging on, and I feel quite deeply about it. I want to commend you for being very fair here this afternoon in presenting your testimony.

Senator WATKINS. Mr. Chairman, there is not very much left for me to say after what has been said by the chairman and the other two members of the committee who are present. I do feel that you have shown a cooperative spirit. I think it should be a good example for other utility leaders to take. If they really get in and cooperate, we can have the partnership that Secretary McKay has been talking about.

Mr. PATTERSON. I believe that is right, sir.

Senator WATKINS. We will have a lot better feeling and we will get the progress we have been looking for out in the West, particularly where we have these large projects to be built.

Senator MILLIKIN. Thank you very much, Mr. Patterson.

Mr. PATTERSON. I want to thank all the members of the committee for the opportunity of presenting our statement.

Senator MILLIKIN. Mr. Amend, president of the REA StateAssociation of Colorado. We are glad to have you, Mr. Amend. Sit down and make yourself comfortable.

## STATEMENT OF LEWIS E. AMEND, ROCKY FORD, COLO.

Mr. AMEND. Gentlemen of the committee, my name is Lewis E. Amend. I live out from Rocky Ford, Colo., about 6½ miles, where I own and operate an irrigated farm.

Senator ANDERSON. How large a farm?

Mr. AMEND. 130 acres.

Senator ANDERSON. I notice one of the witnesses here said he operated 6 or 7 hundred acres of irrigated land. Is there no limitation on the acreage in these projects?

Mr. AMEND. Just whatever you are able to get and handle, that is all. He is a big farmer.

Senator ANDERSON. Would there be any limitation on acreage under this project?

Mr. AMEND. No, sir. He is a big farmer, and I am just a small fry.

Senator WATKINS. Senator, when you are furnishing only a supplemental water right, it seems to me the rule has to be a little bit different.

Senator ANDERSON. I not only agree with you, but I voted with Senator Millikin on the San Luis project in season and out of season for doing that, but there are those who do not believe that.

Senator JACKSON. What is the law on the subject of providing supplemental water? You are providing water to existing farms. Does the 160-acre limitation apply in the absence of an amendment in the authorizing bill?

Mr. WITMER. Mr. Chairman, the present law makes no distinction between supplemental water projects and any other.

Senator JACKSON. That does not seem fair.

Senator WATKINS. As a matter of policy you are not enforcing it on most of these projects where you have supplemental water only.

Mr. WITMER. I could not say that we are.

Senator WATKINS. You would not say that you are, either. I am quite sure of that.

Senator JACKSON. If a man has 200 acres, he would have to sell off 40 acres, then, and you would be breaking up farms.

Mr. WITMER. Is this a man without a wife?

Senator ANDERSON. You have to get a community property State before you get that.

Mr. WITMER. No, sir. There is no distinction between the community and noncommunity property States. 160 for a man, and 160 for his wife if he wants his wife to have it, whether it be community property or otherwise.

Senator JACKSON. 320?

Mr. WITMER. Yes.

Senator WATKINS. And then 160 for each of the children as well?

Mr. WITMER. If they want to take title in their names.

Senator JACKSON. You ought to make a provision to take care of some of us who are not in either situation.

Senator WATKINS. I notice you are not out on a reclamation project. You have taken care of yourself pretty well.

Senator MILLIKIN. May we have your testimony, please, Mr. Amend.

Senator ANDERSON. Mr. Chairman, I was just going to say if this project is adopted, and if the 160-acre limitation is in there, we ought again to try to put in some language that might do something on supplemental water.

Senator MILLIKIN. I agree.

Senator ANDERSON. I fully subscribe to what the Senator from Colorado suggested with reference to the situation in Colorado in that project where we were supplying supplemental water. I think it is entirely different from a major reclamation project where you are supplying primary water. I think these people, if they come into this project, ought not to have the pattern of farm ownership disturbed by our addition of some supplemental water to the tail end of their normal irrigation season.

Senator MILLIKIN. Go ahead, Mr. Amend.

Mr. AMEND. As a matter of identification, I am at present and have for the past 4 years served as president of the Southeast Colorado Power Association—it is written here 4 years, but actually it is 5 now. This is a little old. Their offices are in La Junta, Colo. For the same period I have served as president of the Colorado State Association of Rural Electric Cooperatives, and for a similar time have served as legislative chairman of region 7, which comprises the States of Wyoming, Nebraska, Kansas, and Colorado. These offices, may I emphasize, are elective and subject to the will of the rural people involved. I mention these only to emphasize the fact that the report or testimony I am about to give you comes from the hearts and minds of the rural people living in southeast Colorado.

I am here as a member of the delegation appearing before you in support of the Fryingpan-Arkansas project.

Mr. Chairman, if I might digress for just a moment, being a dirt farmer, I should like to emphasize the testimony given yesterday by Mr. Cooper and Mr. Ryan as being some of what I consider the most significant that has been introduced in this hearing.

Senator MILLIKIN. They were the dirt farmers.

Mr. AMEND. Yes, sir.

My personal part in the support of this project is the representation of three rural electric cooperatives which are definitely within the scope of this great project, and lying directly in the Arkansas Valley from the Continental Divide at Salida east to the Colorado-Kansas line.

While I am president of the Colorado State Association, may I add here that the State association is by no means involved in this except in just the general principles of the rural electrification movement.

The systems mentioned——

Senator JACKSON. May I interrupt. I may have to leave in a moment. Are you satisfied with the wheeling agreement that you have now? Do you have a wheeling agreement?

Mr. AMEND. We have no wheeling agreement at present.

Senator JACKSON. You are buying your power from the southern Colorado?

Mr. AMEND. We are buying some power from the Southern Colorado Power Co., some from the city of La Junta, the city of Lamar, the city of Trinidad, and a little bit from the Frontier Power Co. of Walsenburg.

Senator JACKSON. You heard Mr. Patterson's testimony?

Mr. AMEND. Yes, I did.

Senator JACKSON. What is your reaction to his testimony on wheeling this power?

Mr. AMEND. Senator, if I were to express my reactions, I assure you they would be entirely personal at this point, for this reason: I am here representing these three cooperatives, and this testimony was not made available to us until I came down here. They accepted this thing on the basis as presented by the Bureau of Reclamation. Until they have time for further study, I should be reluctant, indeed, to express an opinion. However, I am sure——

Senator JACKSON. What is the attitude of the REA's on the agreement, which I think was signed about a year or so ago in connection with the wheeling of the power from the Colorado-Big Thompson and the other Federal power projects in the State?

Mr. AMEND. What was your question now?

Senator JACKSON. What is the attitude of your members? I notice you are president of region 7, which covers the whole State of Colorado. What is the attitude of region 7 of the REA cooperative organization? What is the attitude of your REA co-ops that are now being served under a wheeling agreement with the Public Service Co. of Colorado?

Mr. AMEND. I do not know that their attitude concerning this has ever been brought to my attention.

Senator JACKSON. Do you know whether the wheeling rates appear to be fair and just?

Mr. AMEND. I have a general idea of what those rates are, but I was not sure enough a while ago to get up and say what they are. I would not want to read it in the record. I have a general idea.

However, in the matter of wheeling, I think consideration should be given to various areas. I do not believe that you could say that what is fair for another part of the country would necessarily be fair for Colorado, inasmuch as we have some rugged country, I grant, but a great deal of it is wide open country, and with very little timber. It does not approach the situation in these eastern and southern countries, where there is so much timber and so much undergrowth. A lot of that is prairie land, smooth as the table.

The systems mentioned are the Sangre de Cristo Electric Association at Salida, Colo., the San Isabel Electric Association, Inc., at Pueblo, Colo., and the Southeast Colorado Power Association at La Junta, Colo.

These three systems currently and collectively represent some 35,000 farm and ranch people, including some villages and small industries lying within their boundaries. These people are scattered over an area comprising at least one-fourth of the State of Colorado, and living in 17 of its 63 counties, and are all directly engaged in the production of the food and fiber so vital to our national defense and to their own health and personal welfare.

There is at present a great and growing need for additional water, both irrigation and domestic, as well as a dire need for additional source and supply of electric light and power. I shall confine my few statements to the latter.

These systems mentioned are currently supplying 23 million kilowatt-hours annually to 8,088 consumer members on something over 5,366 miles of rural distribution lines, and according to their several system studies they will ultimately require a firm power supply reaching well toward 60 million kilowatt-hours on something over 19,000 kilowatt demand.

Their steady growth and rising demand has brought great stress on all available sources, to the point that we are and have been for some time very fearful of our future source of supply. Our principal supplier, the Southern Colorado Power Co., has indicated that upon the termination of our present contracts, they will no longer be able to supply our needs unless some plans are made now for additional generating capacity. They have suggested that we explore the possibilities of other sources of supply.

Accordingly, the systems herein mentioned employed the Guernsey Engineering Co. of Oklahoma City, Okla., to study all possible sources and methods of supplying our present and future demands.

This company by its study had definitely concluded and established that beyond a doubt the most logical method is through establishment or construction of additional generating facilities.

If, however, these three systems join in the construction of such plant or plants, it will necessitate the borrowing of additional money from the Federal Government for such construction. These systems are neither anxious nor willing to incur further indebtedness, since the Fryingpan-Arkansas, a multiple-purpose project, will meet all demands and supply all needs. It appears beyond all doubt or suspicion that this is the course that should logically be pursued.

From an area coverage standpoint, the Sangre de Cristo system is now about 97 percent complete, the San Isabel 90 percent, and the Southeast Colorado Power Association 80 percent. This simply means, gentlemen, that this part of the rural people have been reached by highline service, and does not mean that their increased use has been adequately provided for; this by no means implies that our job is even nearing completion. Our power requirements are growing year by year and demands are increasing continually. By the end of 1953, these systems should be well along toward area coverage, and based on a recent load survey, they will collectively show a firm load demand of 42,923,000 kilowatt-hours by 1955; 51,486,000 kilowatt-hours by 1958; and, by 1963, 63,513,000 kilowatt-hours.

Inasmuch as all present facilities are strained to capacity and eagerly viewing the vast hydropotential created and sustained by the Fryingpan diversion plan set forth by the Bureau of Reclamation, we respectfully submit the following facts and figures in support of the said Fryingpan-Arkansas project, and request that due consideration be promptly given to these rural power needs as well as urban and industrial loads.

These figures submitted here are attached as an exhibit. I shall not read them. They are quite tedious.

(The data referred to follow:)

*Sangre de Cristo Electric Association, Inc., Salida, Colo.*

| Year | Miles of line | Kilowatt-hours purchased | Cost per kilowatt-hour | Total members Dec. 31 | Farm members served | Average kilowatt-hour usage, farm | Average bill, farm |
|---|---|---|---|---|---|---|---|
| 1942 | 16 | 1,647,000 | $0.0101 | 246 | 23 | 40.58 | $4.29 |
| 1943 | 16 | 2,304,000 | .0099 | 253 | 23 | 51.74 | 4.32 |
| 1944 | 17 | 1,125,000 | .0105 | 490 | 27 | 54.11 | 4.25 |
| | | 930G | .5376 | | | | |
| 1945 | 122 | 2,561,400 | .0103 | 549 | 150 | 61.51 | 4.66 |
| 1946 | 130 | 2,350,440 | .0106 | 918 | 170 | 81.26 | 5.17 |
| 1947 | 226 | 2,456,328 | .0131 | 956 | 248 | 88.42 | 5.31 |
| 1948 | 232 | 1,955,016 | .0149 | 1,003 | 259 | 113.49 | 6.13 |
| 1949 | 332 | 1,857,084 | .0142 | 1,006 | 290 | 132.69 | 7.42 |
| 1950 | 364 | 2,166,900 | .0118 | 1,038 | 336 | 144.85 | 7.57 |
| 1951 | 441 | 2,187,864 | .0090 | [1] 977 | 379 | 157.00 | 7.29 |
| 1952 | 460 | 2,497,950 | .0093 | [2] 998 | 413 | 190.00 | 7.48 |

[1] This does not include 57 cabins connected only during the summer and not connected as of Dec. 31, 1951.
[2] This does not include 62 cabins connected only during the summer and not connected as of Dec. 31, 1951.

*Southeast Colorado Power Association, La Junta, Colo.*

| Year | Kilowatt-hours purchased | Total cost kilowatt-hours | Cost per kilowatt-hours | Total members, Dec. 31 | Farm members | Miles of line | Average kilowatt-hours, farm | Average farm bill |
|---|---|---|---|---|---|---|---|---|
| 1943 | 10,011,363 | $103,262.44 | $0.0103 | 1,539 | 1,394 | 780 | 81 | $4.72 |
| 1944 | 12,139,767 | 125,920.96 | .0137 | 2,666 | 1,551 | 790 | 85 | 4.82 |
| 1945 | 10,835,348 | 108,190.71 | .00998 | 3,007 | 1,737 | 1,139 | 103 | 5.26 |
| 1946 | 7,633,781 | 81,162.01 | .01063 | 3,826 | 2,325 | 1,150 | 84 | 4.43 |
| 1947 | 8,270,240 | 99,307.85 | .012 | 3,814 | 2,092 | 1,144 | 112 | 5.57 |
| 1948 | 9,853,261 | 134,523.43 | .01365 | 4,329 | 2,316 | 1,390 | 136 | 6.08 |
| 1949 | 10,877,382 | 135,076.06 | .0124 | 3,915 | 2,425 | 1,431 | 138 | 6.43 |
| 1950 | 11,732,679 | 133,853.82 | .0114 | 4,443 | 2,706 | 1,824 | 164 | 7.18 |
| 1951 | 13,498,690 | 148,072.37 | .01096 | 4,658 | 2,906 | 1,876 | 155 | 7.20 |
| 1952 | 17,737,243 | 192,991.43 | .01087 | 5,779 | 3,878 | 3,690 | 178 | 8.15 |

Date of energization, July 1938.
Percent coverage in area, 80 percent.

*San Isabel Electric Association, Inc., Pueblo, Colo.*

| Year | Kilowatt-hours purchased | Kilowatt-hour cost | Total members Dec. 31 | Farm members | Average kilowatt-hours, farm | Average farm bill |
|---|---|---|---|---|---|---|
| 1942 | 295,500 | $0.018 | 215 | 95 | 85 | $4.93 |
| 1948 | 1,350,910 | .016 | 881 | 329 | 140 | 6.59 |
| 1949 | 1,742,584 | .013 | 962 | 369 | 163 | 7.16 |
| 1950 | 2,010,934 | .013 | 1,041 | 389 | 180 | 7.56 |
| 1951 | 2,177,549 | .013 | 1,119 | 453 | 187 | 7.86 |
| 1952 | 2,467,488 | .013 | 1,156 | 451 | 208 | 8.06 |

Date of energization, May 1941.
Percent coverage in area, 90 percent.

Mr. AMEND. I should like further to emphasize the importance of this diversion plan to the rural electrics in the matter of their commitments to the Federal Government and their ability in the not too distant future to discharge their obligation of principal and interest payments.

The Federal Government to date has underwritten REA loans in this area in the amount of $9,418,000, which will no doubt be increased appreciably in the future. The increased generating capacity installed will beyond all doubt influence our rate schedule to

the point of stabilization where we will be insured of payment of interest and principal.

These rural electric systems are by no means incidental to the economy of the area. They are by no means incidental to the economy of our Nation.

In the 17 Colorado counties served in whole or in part by the 3 mentioned systems, they paid in taxes in 1950, $41,200; in 1952, $50,500; and will, according to load surveys, advance to $87,700 in 1957.

Our kilowatt consumption in 1950 was 12.6 million; in 1952, 17.3 million; and in 1957 will reach 36.3 million.

Gentlemen, I should like to emphasize that this is a multiple-purpose project, and the power phase is one of the imperative considerations. Please bear in mind that only 15 percent of the present national population is engaged in our greatest and most essential industry, American agriculture. I presume that Colorado's percentage is probably about the same.

Upon this 15 percent devolves the responsibility of feeding our Nation and providing much for export trade and much to give away.

We would never think of and never countenance the construction of any great production plant without adequate water and electric-power facilities. Therefore, I urge upon you gentlemen to weigh heavily and consider well the merits and progressive potentials of this, one of the Nation's important construction and retrenchment activities, ever bearing in mind that economy is a great thing, but there is a vast difference between cutting expenses and spending, and simply cutting investments.

I believe it was Mr. Lincoln who said that the first principle of government is to help the people to do what they could not do so well or could not do at all for themselves. I consider that a significant statement as related to the Arkansas diversion project.

I should like to add something to this human element concerning this rural electrification program in Colorado and in all the Nation, particularly in this area that will be so variously affected by the construction of the Fryingpan-Arkansas project. These people will be able to enjoy modern homes. They will enjoy and use supplemental power on their farms. If you follow me—and I am sure you do—the whole thing provides an unlimited increase in taxation. I would have no idea how to arrive at the percentage of increase in taxes through the advent of electrical service to the rural people. I believe, and I sincerely believe, that rural electrification in itself is worth far more as a tax-inspiring organization than it is a taxpaying organization.

Gentlemen, we who have appeared before you and we of the rural electric cooperatives, sincerely feel that this project is legitimate. By our presentation we have tried to prove that it is feasible. When assistance is granted, we will try then to prove that it was just plain, good, sound, progressive judgment.

It is very kind of you to listen. I appreciate it.

Senator MILLIKIN. The committee appreciates your coming all the way down here and the testimony that you have given. Give our best regards to your people.

Mr. AMEND. Thank you, sir.

Senator MILLIKIN. Any questions, Senator Anderson?

Senator ANDERSON. No questions. I am very glad that you are pretty well sold that the REA loans are being adequately repaid and promptly repaid, and that there is no danger in them.

Mr. AMEND. If we want to go into the economics of it, I am sure you will find out that rural electrification, since the Government has underwritten some $8.2 billion, is less than four-tenths of 1 percent delinquent. That is a pretty good business record.

Senator ANDERSON. Yes. I think collections are better there in the Government than they are from some of the taxpayers.

Mr. AMEND. I have no comment on that, but I think it is the greatest peacetime project that our Government has ever undertaken.

Senator MILLIKIN. Mr. James T. McBroom, Coordinator of the Office of River Basin Studies, Fish and Wildlife Service, Interior Department.

## STATEMENT OF JAMES T. McBROOM, COORDINATOR, OFFICER OF RIVER BASIN STUDIES, FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

Mr. McBROOM. Thank you, Mr. Chairman.

Mr. Chairman and Senator Anderson:

My name is James T. McBroom. I am Coordinator of the Office of River Basin Studies, Fish and Wildlife Service, Department of the Interior.

I have a very brief statement on this project which I would like to read.

Fishing and hunting are of considerable financial and recreational significance in the diversion area on the west slope and in the upper Arkansas Valley on the east slope.

West slope: In that part of the project area lying west of the Continental Divide, the Roaring Fork-Fryingpan Rivers support a valuable trout fishery. As a result of recommendations made by the Office of River Basin Studies, Fish and Wildlife Service, in cooperation with the Colorado State Game and Fish Commission, plans for construction and operation of the West Slope portion of this project have been modified insofar as practicable in order to protect these fishery resources.

The modifications include enlarging the west slope collection system and the transmountain tunnel. These facilities will permit a greater diversion of water through project facilities for use by the Twin Lakes Reservoir & Canal Co. on the east slope. In turn, this will permit specified minimum flows to pass the company's diversion dams on the Roaring Fork River. With these flows, as well as those to be provided in streams of the Fryingpan system to be affected by project diversions, maintenance of the fishery of the Roaring Fork-Fryingpan Rivers will be assured.

Those flows, Mr. Chairman, are the ones specified in Senate Document 106 on page 21, items 9 and 10.

Wildlife on the west slope will be detrimentally affected by destruction of habitat in the Aspen Reservoir area and canal rights-of-way. Opportunities for preventing this damage are few. Although canals will constitute no barrier to big-game migrations, foot bridges should be provided across these canals where needed to permit access to the area by hunters, thereby facilitating the harvest of big game.

East slope: The upper Arkansas River and headwater tributaries are considered to have great potential value for fishing. Flow modifications resulting from diversions and powerhouse releases might seriously impair the upper Arkansas River as a trout stream unless adequate provision is made for streamflows as on the west slope. If these flows are reduced too far, the effects of pollution will be increased, water temperatures will be raised, and invasion of the stream by undesirable aquatic plants would probably occur. Minimum stream flows to be recommended by the Fish and Wildlife Service will, if followed, maintain the present fishery.

Diversion of polluted water may impair the fishery value of Twin Lakes Reservoir and of Clear Creek Reservoir. Snowden Canal, therefore, should head above the confluence of the California Gulch and the Arkansas River if the source of mine-tailing pollution is to be avoided in these two reservoirs.

Losses to wildlife on the east slope will be similar to those anticipated for the west slope. Detrimental effects of the Arkansas power canal, which will be a barrier to big-game migration, could be minimized by providing bridges for these animals and by fencing both sides of the canal.

The studies made and the modifications incorporated in the project plan are in accord with the policy of Congress established in the Coordination Act of August 14, 1946. That act provides that the Fish and Wildlife Service, together with the State agency exercising administration over wildlife resources, shall determine means and measures which should be adopted to prevent loss of and damage to fish and wildlife resources.

The studies thus far made by the Fish and Wildlife Service are in the nature of general, preauthorization investigations. Detailed investigations by the Fish and Wildlife Service should be made following authorization and prior to construction. They would parallel the detailed engineering studies which would be made by the Bureau of Reclamation during the same period.

The Secretary of the Interior will be authorized to carry out these detailed fish and wildlife studies by the inclusion of preservation and propagation of fish and wildlife in the enumeration of project purposes in the legislation authorizing the project. As a result of such detailed studies, it may be desirable to make some modifications in and additions to the project plan for the protection of fish and wildlife resources. From the standpoint of the Fish and Wildlife Service, it would be desirable to have the legislation authorizing the project sufficiently flexible to permit the Secretary to make such reasonable modifications in and additions to the project plan.

With these safeguards, and on the basis of conclusions from studies already made, the Fish and Wildlife Service is confident that substantial protection can be given the outstanding fish and wildlife resources of the project area.

Senator MILLIKIN. Thank you very much. Thank you for your patience in staying with us to the end.

Mr. MCBROOM. Thank you for hearing me, Mr. Chairman.

Senator ANDERSON. Is there some credit for fish and wildlife in this project?

Mr. MCBROOM. There are no benefits shown to fish and wildlife in the cost-benefit analysis, Senator Anderson.

Senator ANDERSON. What is the $2,179,000?

Mr. MCBROOM. That item is $2,830,000, Senator, and it is for extension of the collection system on the west slope to provide additional water for the Twin Lakes Canal Co. for use on the east slope. It is also for enlargement of the tunnel and for enlargement of some of the rest of the collection system on the west slope.

Senator ANDERSON. This says "Fish and wildlife, $2,179,000."

Mr. MCBROOM. That was on the old price basis, Senator. On the current price basis, it is $2,830,000.

Senator ANDERSON. Again, I did not understand your explanation of it. You said it was for the collection of what?

Mr. MCBROOM. Collection of extra water on the west slope for diversion through the tunnel over onto the east slope. It will be provided to the Twin Lakes Reservoir & Canal Co. so they may forego some of their diversions which they are entitled to make under their project facilities which now exist.

Senator ANDERSON. What has that to do with fish and wildlife?

Mr. MCBROOM. To go back a little bit, Senator Anderson, the Twin Lakes Reservoir & Canal Co. already has a right to divert water from the Roaring Fork River through its own tunnel into its own Twin Lakes Reservoir. What we want to do here and what the Bureau and the Fish and Wildlife Service and the State agencies have agreed to do, is to get extra water from the Fryingpan area and some from the Hunter Creek area, and divert it around through the Bureau's tunnel so that the company will forego maximum diversions through its tunnel and permit more water to pass downstream and maintain the fish life.

It is a rather complicated situation, I am afraid.

Senator ANDERSON. For that you expect the Federal Government to pay 2,800,000-and-some dollars?

Mr. MCBROOM. This is an area of outstanding fishery resources. As pointed out in the statement, the Coordination Act of August 14, 1946, provides that measures to protect and preserve fish and wildlife resources shall be incorporated in these reclamation projects.

Senator ANDERSON. I assume that you are here to justify this item, are you not?

Mr. MCBROOM. Yes, sir. My purpose is to explain the plan for preservation of fishery resources. As for the justification, I have no figures available now on the dollar value of the fishery resources. More specifically, I would like to justify the maintenance of minimum streamflows in Fryingpan and Roaring Fork Rivers specified in Senate Document 106, pages 21 and 22, which are a part of the principles of project operation recommended by the policy and review committee organized by the Colorado Water Conservation Board. These principles have been agreed to by the State, the Bureau of Reclamation, and the Fish and Wildlife Service.

Senator ANDERSON. How do you get to this figure?

Mr. MCBROOM. This figure is the construction cost estimated by the Bureau of Reclamation, to develop the extra water which will be needed to supply this company, which already has——

Senator MILLIKIN. You are suggesting additional things that should be done in addition to that. You are suggesting runways across the creek; you are suggesting a fence along the canal. That is not included in that report.

Mr. McBroom. That is true, though language in the proposed legislation would be broad enough to cover minor changes of this character. But the major problem here, Senator Anderson, is the preservation of the fish resource on the west slope. The expenditure of this money——

Senator Anderson. Is the fishery resource on the west slope in any trouble at the present time?

Mr. McBroom. It is not in trouble, but——

Senator Anderson. Why should the Government pay because somebody else wants to divert water, and why should the Government charge that to fish and wildlife? That is what I am trying to have you explain to me.

Mr. McBroom. Senator, I just want to say that the Twin Lakes Reservoir & Canal Co. does not now divert enough water to damage substantially the fish in the Roaring Fork River, but when they have this enlarged reservoir on the east side, the Twin Lakes Reservoir, they might then take advantage of their legal right and divert more. That is the only thing that is holding them back now.

Also, they must satisfy, before they divert through the mountain, the legal rights on the west slope. These legal rights, many of them, will be satisfied by water stored in the Aspen Reservoir thus permitting the company to divert more water in the upstream area and leave less in the streams at critical times of the year. So you see, there is great potential damage from the project.

Senator Anderson. But the Government is not damaging anybody, is it?

Mr. McBroom. The Government, by building these two reservoirs on either side of the Twin Lakes diversion, will make possible potential damage by the Twin Lakes Reservoir & Canal Co. But by providing the company with extra water, we hope to see that that damage does not occur.

Senator Millikin. Has your statement been cleared by the Secretary of the Interior?

Mr. McBroom. It has not been cleared by the Secretary personally, but it has been cleared in accordance with established procedures within the Department and by the Director of the Fish and Wildlife Service. The statement is intended to support the authorization of the Fryingpan-Arkansas project in accordance with the Secretary's recommendations to the Congress.

Senator Anderson. Your statement talks about these other things, as Senator Millikin points out, but it does not justify the $2,800,000 figure, as I see it, at all. I was not able to get anything out of your statement justifying that $2,800,000.

Mr. McBroom. Let me point to the third paragraph, Senator Anderson.

Senator Anderson. I am glad to have you do that.

Mr. McBroom. The modifications include enlarging the west slope collection system and the transmountain tunnel. These facilities will permit a greater diversion of water for use by the Twin Lakes Reservoir & Canal Co. on the east slope. They will take it around through the project tunnel and deliver it over to the company on the eastern side. In turn, this will permit specified minimum flows to pass the company's diversion dams on the Roaring Fork. With these flows, as well as those to be provided in the streams of the Fryingpan-

Arkansas system to be affected by project diversions, maintenance of the fishery on the Roaring Fork-Fryingpan Rivers will be assured.

Senator ANDERSON. Where are the Roaring Fork and Fryingpan Rivers?

Mr. MCBROOM. May I show you a small map in the Bureau of Reclamation report? I think it will show up a little better on it.

Senator MILLIKIN. Will someone point out the Roaring Fork?

Senator ANDERSON. I see where they are.

You are taking it from the other side of the mountain. How does that protect the fishing on this side of the mountain from which you are taking the water, and why should the Government pay for it? That is what I want you to tell me. That is all.

Mr. MCBROOM. May I show you this smaller map, Senator.

Senator ANDERSON. Can I look at the larger one? If you had eyes like mine, you would want to look at the larger one.

Mr. MCBROOM. Then I will try to point it out on this one.

The Twin Lakes Reservoir & Canal Co., presently has a diversion through the Continental Divide at this point [indicating]. This is the head of the Roaring Fork River. What we propose to do, what the plan is, is to extend the collection system by a canal 8 miles long at that point [indicating]. Then take this water around through the project tunnel into the Twin Lakes Reservoir enlargement.

By so doing, the company will utilize this water so collected and forego diversions, to which it has a legal right from the State of Colorado, and permit the water to pass on down the stream, which will protect the fish life in that area.

Senator ANDERSON. You will have to put more water in there than now is in there?

Mr. MCBROOM. It will prevent the company from taking it all out or most of it in accordance with their legal right.

Senator ANDERSON. How much are they going to divert?

Mr. MCBROOM. 100 second-feet is what the facilities are set up for.

Senator ANDERSON. How much do they now divert?

Mr. MCBROOM. They now have a right to divert——

Senator ANDERSON. How much do they now divert?

Mr. MCBROOM. They now divert 38,000 acre-feet a year.

Senator ANDERSON. How much is 100 second-feet translated into a thousand acre-feet per year?

Mr. MCBROOM. Can you help me on that, Ben?

Mr. POWELL. Senator Anderson, these tunnels and diversions do not operate at high efficiency. A second-foot diversion through the mountains at that altitude and under those conditions will transfer about 100 acre-feet per year. If that second-foot operated continuously, it would transfer through the mountain 728 acre-feet of water.

So this 100 second-feet which Mr. McBroom spoke of will transfer across the mountain about 3,000 acre-feet of water, and that is about the amount of water that is needed to remain in the upper end of the Roaring Fork River above Aspen to maintain the fishing conditions and fishlife.

Senator ANDERSON. In other words, they are not going to take out any more around there than they are taking out down here now?

Mr. POWELL. No, sir. They will decrease their diversion at the head of the Roaring Fork, the Twin Lakes people will, and a like amount will be turned over to them at the Twin Lakes lake.

Senator ANDERSON. For that even trade we are going to pay $2,800,000 out of the Federal Treasury?

Mr. POWELL. That is right, sir.

Senator ANDERSON. How do you justify that?

Mr. MCBROOM. Senator, let us say the Bureau of Reclamation built the Aspen Reservoir and enlarged the Twin Lakes Reservoir so that the company could satisfy the west slope interests just by reregulation at Aspen and could divert up to their full right over on the east slope to the Twin Lakes Reservoir. Unless there were these safeguards as to minimum stream flows, the operations of the company might virtually dry up the Roaring Fork River and destroy a very substantial fishery resource.

Senator ANDERSON. How long have they had a right to divert up there?

Mr. MCBROOM. Since about 1924, I believe.

Mr. POWELL. 1937.

Senator ANDERSON. That is nearly 30 years.

Mr. MCBROOM. 1937, Senator.

Senator ANDERSON. That is 25 years. They have not done it, have they?

Mr. POWELL. They have not done it because they have not had the facilities to do it.

Senator ANDERSON. Why do you think they would do it otherwise?

Mr. MCBROOM. For one thing, the company has to satisfy the downstream rights on the west slope.

Senator ANDERSON. But they are getting just as much water as they are now getting. They are going to get just as much water by the diversion as they got before.

Mr. MCBROOM. That is right.

Senator ANDERSON. Why does that damage them $3 million worth? In other words, if I have a place to park my car every night and it is still there but they move it a notch in the garage, am I damaged? You have the same thing you had before. You have the same water coming through, have you not? It comes around a little differently. It comes in through another place. Why does the United States Government put up $3 million for that?

Mr. MCBROOM. Because, Senator, they will have the legal right granted them by the State of Colorado to take a good deal more water out of the Roaring Fork River, considering the operation of these two proposed project reservoirs.

Senator ANDERSON. Did you not tell me that this was the headwater of the Roaring Fork River [indicating]?

Mr. MCBROOM. That is right, sir.

Senator ANDERSON. Are they not going to take it out of the Roaring Fork River up this way?

Mr. MCBROOM. Most of it will come out of the Fryingpan. There is an extension that comes down into that. It is on Hunter Creek, which is a tributary of the Roaring Fork.

Senator ANDERSON. Do they take it through here now?

Mr. MCBROOM. They do, except that they have to satisfy downstream rights on the west slope, and they do not have the storage capacity on the east slope to take their full right.

Senator MILLIKIN. Has Fish and Wildlife approved the engineering for this project?

Mr. McBroom. Yes, sir, we support the report of the Secretary on this project, Mr. Chairman.

Senator Millikin. Thank you very much.

(Off the record.)

Senator Millikin. Mr. Ducy?

Are there any other witnesses, other than Mr. Ducy? (No response.)

Mr. Ducy, please.

## STATEMENT OF DAMIAN DUCY, PRESIDENT, WATER DEVELOPMENT ASSOCIATION OF SOUTHEASTERN COLORADO

Mr. Ducy. I am Damian Ducy, president of the Water Development Association of Southeastern Colorado, and president of my own company, which operates in the real estate and insurance fields. I have lived in Pueblo since the age of 2, and can well remember dirt streets and wooden sidewalks. I have served as president of many civic organizations in my own community, State, and on the national level. I submit this statement on behalf of my executive committee, consisting of Harold H. Christy, Frank Hoag, Jr., and John W. Beaty.

Harold H. Christy has lived most of his life in the Arkansas Valley, is an engineering graduate of the Colorado School of Mines, and for many years has been superintendent of the power and water department of the Colorado Fuel & Iron Corp., Colorado's largest employer.

The second member is Frank Hoag, Jr., a native Puebloan and publisher of the third largest newspaper in the State of Colorado, and, of course, the largest one in the Arkansas Valley. Frank, like myself, has headed up many civic organizations on the local and State level.

The other member of my committee is John W. Beaty, a lifetime resident of Colorado, rancher, farmer, and banker, who lives in Manzanola, an Arkansas Valley community, founded by his dad.

First of all, I would like to thank you gentlemen for having arranged the time from your busy days to grant us a hearing as to the Fryingpan-Arkansas project, which is so important to the future of our section of Colorado and, in turn, to the prosperity and well-being of Colorado and these United States. We appreciate the courteous treatment afforded our witnesses to this moment.

We come before you to ask for a loan, and consequently place ourselves in the position of a borrower who has done business with a small bank which, due to its limited capital, cannot make large loans. We consider you the loan committee of a large bank and your duties as that of having to examine our applications and report to the board of directors, which is Congress.

The Water Development Association of Southeastern Colorado was formed in 1943 by many citizens who realized that the Arkansas Valley had exhausted all of its resources to gain additional water through private capital. Many small single-purpose diversions have been accomplished in an effort to increase the water supply, and many wells have been drilled, but our needs have not been met.

The founders of our organization, who had invited the United States Bureau of Reclamation in for investigations as far back as 1930, realized that our only chance for survival was the construction of a multipurpose project such as the proposed Fryingpan-Arkansas. This project has been presented to you from the physical, legal, agri-

cultural, and power sides by previous witnesses. This project will not only allow for a small diversion of Colorado River water, but will also serve as a means of flood control, sediment control, will allow falling water to produce hydroelectric power, and will also improve and create wildlife and recreational values.

Some 4,000 members of our organizations who request, through me, your consent to the loan which we desire, have resolutions, statements, and so forth, which I would like to file for the record, backed by 170,000 people well prepared to offer evidence of these facts.

Senator MILLIKIN. Do you have those resolutions with you?

Mr. DUCY. I do have; yes.

Senator MILLIKIN. How bulky are they?

Mr. DUCY. Only one page apiece.

Senator MILLIKIN. Put them in the record, please.

Mr. DUCY. Thank you, sir.

Colorado is known as the Centennial State, having been admitted to the Union in 1876. However, our civilization goes back to 1850 when our few communities were trading posts, often consisting of not over a few hundred people. We have grown for the past 100 years to a point where we are now 33d in population and 22d in taxable revenue to the United States, according to figures upon which I rely.

Our resources are quite varied, which is important to a banker, for diversification of assets and energy assures a more stable loan. Our greatest source of income is from agriculture, including livestock raising; and our farm population, according to my figures, which do not agree with Mr. Amend's, is about 22½ percent of the whole. Our next greatest source of income is from industry, and the Colorado Fuel & Iron Corp., located in Pueblo, is the largest employer of labor in the State. This company is the ninth largest producer of steel in the United States. Next comes our tourist trade. Some of you, I know, have visited Colorado and are acquainted with the many attractions which we have to offer, as well as our delightful climate. Although Colorado is thought of as a mining State, this industry is fourth in importance as far as income is concerned.

Physically, Colorado is divided by the Continental Divide, but I am glad to state that our people, totaling some 1,350,000, recognize no such barrier, for we have a fine saying in Colorado that "What is good for one part of the State is good for all."

Some very interesting studies have been made as to our natural resources, and there is one in particular which I would like to refer to for just a moment, made by Mr. Charles Patterson, an outstanding engineer, on behalf of the Colorado Water Conservation Board. I believe Mr. Patterson is now retained by some entity in the State of California.

As a result of the various compacts relating to the Colorado River, Colorado has been granted the use of 51.75 percent of the upper basin allotment, which roughly figures about 3,800,000 acre-feet, and we are allowed to put this to beneficial use if we take the proper steps in time. We in Colorado use roughly 1,600,000 acre-feet, which means a surplus of better than 2 million acre-feet, before allowing for transportation losses, evaporation, and so forth.

We ask for diversion of only 70,000 acre-feet, which is less than 4 percent of the water allocated to Colorado which is not now being used.

This Patterson study discloses that in Colorado various important characteristics were notable between the east and west slopes of the Continental Divide, and I submit to you herewith the following figures:

| | East slope | West slope |
|---|---|---|
| | *Percent* | *Percent* |
| Land area | 54 | 37 |
| Water resources | 18 | 68 |
| Irrigated land | 49 | 26 |
| Water production | [1] 1.9 | [1] 13.4 |
| Arable land, if water | 90 | 5.4 |

[1] Acre-feet per year.

The marked variances mentioned above are, of course, due principally to the topography of the western part of Colorado, for it is there that most of our high peaks are located.

The average rainfall in Colorado varies from as low as 11 inches to as high as 50 inches, with an overall average of 16 inches. However, the historic average is a trifle less than 12 inches in Pueblo County. We have known a year with as little as 6 inches of moisture, and it is said that in 1894 there were but 2 inches. Since the middle of last September, our Pueblo weather station has recorded only a trifle over 4 inches of moisture.

We have found that the average water supply passing through our irrigation systems varies greatly. Some of our better ditches can depend on some 3 to 5 acre-feet per year over a period of 200 days, while others can depend on only 1 acre-foot, if lucky, and that for about 50 days.

The Arkansas Valley and its basin encompasses the bulk of 12 counties in southeastern Colorado. It extends, as Mr. Powell has told you, from Leadville at the top of the divide, to Holly at approximately the Kansas State line. Also from Colorado Springs at the north to Trinidad on the south.

Pueblo is a community of some 85,000 to 90,000 people and is the largest city in the area. The population of the Arkansas Valley in 1900 was 137,000 people; in 1950, there were 265,000 people and I believe I can safely state that there are 280,000 to 300,000 people today. The water supply is literally the same as 53 years ago.

The security which we offer you for this loan can best be stated by quoting the assessed valuations of our 12 counties as being $345 million in 1952. These values were based upon 1941 indexes in accordance with the new Colorado reappraisal program.

Senator MILLIKIN. May I interrupt. You have spoken of the 12 counties. Will the conservancy district go beyond those 12 counties?

Mr. DUCY. No, sir. It will not encompass the entire area of the 12 counties, but as has been pointed out, the conservancy district outline has not been definitely laid out as yet.

The agricultural pursuits in the valley are much the same as other parts of Colorado with principal crops of alfalfa, sugar beets, vine and vegetable crops, grains, and so forth. The raising of cattle, sheep, some hogs, and a lot of turkeys provide further farm income.

We are rich in natural resources and excellent transportation facilities, and consequently have many fine industries. These industries could be enlarged and would be surrounded by many satellite plants if water and additional power were available. We enjoy a very fine strategic position insofar as the Government's industrial dispersion program is concerned, for we are nestled against the Rocky Mountains. Although we are not located exactly in the center of the country, we are afforded a natural defense barrier by our mountain ranges.

The Colorado Fuel & Iron Corp., again Colorado's largest employer and the ninth largest producer of steel, is located in Pueblo. The Pueblo Ordnance Depot employs almost as many as the C. F. & I.; namely, around 7,500. This depot is located east of Pueblo and it is said to be probably the largest depot in the country and, of course, has been No. 1 in rendering the service necessary in the Korean effort.

The Triplix Corp., a large producer of pistons, is also located in Pueblo. Timken Roller Bearing has a plant located in Colorado Springs. Camp Carson, a very large defense installation, is located in the same city. Other manufacturing enterprises vary from the largest broom factory west of the Mississippi, to many canning factories, packing plants, lumbering, mining, and so forth.

Senator MILLIKIN. The Timken people do defense work, do they not?

Mr. DUCY. They are doing, I think, a special mission for the Government, according to the information we have.

Senator MILLIKIN. And the C. F. & I.?

Mr. DUCY. A great deal of defense work there, as well as the Pueblo Ordnance Depot, the No. 1 supplier in the Korean effort.

We also have many fine institutions in our area dependent upon water and power, such as the Colorado State Hospital at Pueblo, housing some 4,500 patients and employing some 1,800 to 2,000 people. Colorado Springs, Buena Vista, Canon City, and Fort Lyon are also the location of many fine and comparable institutions.

Our cities vary in size from Pueblo with 85,000 to 90,000, Colorado Springs with 55,000, to LaJunta and Lamar with approximately 10,000 folks, and a dozen or more smaller communities such as Rocky Ford, Canon City, Florence, Leadville, Walsenburg, Eads, Holly, and so forth, with populations varying from 600 to 700 people, to 5,000. Many of the smaller communities suffer far more from the shortage of water than do Pueblo and Colorado Springs.

Senator MILLIKIN. How many sugar plants have you?

Mr. DUCY. We have 3 sugar plants, 1 at Holly, 1 at Sugar City, and 1 at Swink, all of which add to the food supply of not only the State but the Nation.

Senator MILLIKIN. How many railroad centers at Pueblo?

Mr. DUCY. We have the Burlington, Rio Grande, Santa Fe, and Missouri Pacific coming into Pueblo, and the Rock Island coming into Colorado Springs.

Senator MILLIKIN. Do you have a large population of railroad folks?

Mr. DUCY. We have approximately 2,000 people employed by the railroads in our center, if I am not mistaken.

These smaller communities depend upon very small diversions from the Arkansas River and upon wells pumped into such meager storage

that should we have a power failure, or well-casing break, they would have a little over 3 days' supply of water.

Senator MILLIKIN. The people that you refer to are the employees?

Mr. DUCY. Yes.

Senator MILLIKIN. They probably represent 8,000 people, counting the employees and their families.

Mr. DUCY. I believe because of our mixed population in southern Colorado, we can figure a ratio of about 3.4 to the family rather than the national ratio of 3.2.

You gentlemen know that a good economy should insure at least a 3 to six months' supply. The same shortage has resulted in many of our communities not issuing building permits, restraining the planting of lawns and shrubbery, and other means to conserve what little water we have. We have many communities in the valley where inhabitants gain water for household purposes by having it hauled in 1,000-gallon trucks, which costs $5 per tankload. This results in no bathrooms which, of course, means losing some of the nicer conveniences of life, and also exposes the people to pestilence and disease. In my own community of Pueblo this year, restrictions as to the irrigation of lawns, shrubbery, and so forth, were placed in effect in late March, the earliest ever known in our history. With the same restrictions affecting everyday life, our people have suffered in the loss of many prospective industries coming into the Arkansas Valley.

Mr. Ryan has presented to you the outlook of the typical farmer in our many communities. We could have introduced many more practical farmers, but in respect to your time, we merged the various statements into the one presented. Mr. Ryan has pointed out to you that our agricultural losses over the past many years can be safely stated as having been approximately 30 percent due to the lack of water, and our inability to place what water we have in the fields at the proper time.

We have done what we believe is an unusual thing in connection with the study of our project, in that our organization, with Roy Cooper as chairman of the committee, in conjunction with the Bureau, has held meetings with 300 individual farmers and made case studies as to their needs and to the benefits which might be derived if supplemental water were available. A summation of these studies is being handed to you for the record.

John Beaty, vice president of our organization, has made a very thorough study as to the benefits to be derived, and it is a conservative estimate that where our annual income from agriculture is now $27 million, that with present prices the small amount of water which we ask would increase this annual income to $34 million, or roughly 25 percent.

We feel that should you grant us this loan, we can repay it, and feel that the studies which we have made, as well as those made by the Bureau, will substantiate this statement. This multipurpose project will not only provide supplemental water so badly needed by our cities, industries, and farmers, but through the construction of the dams referred to in the engineering report, many other things will be accomplished.

First of all, flood control is a very important matter to us. Thirty-two years ago the downtown section of Pueblo stood under 14 feet of

water for the better part of 3 days. The water had rushed down from altitudes as high as 10,000 or 11,000 feet to Pueblo at some 4,600 feet with such great velocity that warnings were practically impossible. Had the Fryingpan-Arkansas been built at that time, some 100 lives would have been saved, and many millions of dollars of property damage could have been averted, and the wasted water conserved for arid years.

The large dam to be created west of Pueblo will not only impound floodwaters, in accordance with decrees on the river, but can be used by mutual agreement among the ditches for storage of water until needed, whether it be conservation of winter runoff, or the usual spring and summer early thaw. This reservoir, by pooling the combined resources of the ditches, will give us great saving through the evaporation wastage now suffered due to many systems supporting shallow reservoirs in the particular areas which they serve. The dams upstream, as well as the one in Pueblo, will catch a tremendous amount of silt each year, which has caused nothing but trouble over the past several decades of our civilization. Quite naturally, these dams will control falling water and allow the creation of hydroelectric power for which a ready market can be developed in our section of Colorado. In addition, our engineers will tie the transmission lines in with other systems.

We have tried to present our testimony in as brief a form as possible, recognizing the importance of your time. We hope we have painted a picture for you which will indicate the dire need for the project. We know that some of you have visited our State and the Arkansas Valley, so that you can picture the situation which we have attempted to set forth. We would like to invite those of you who have not been in Colorado to drop in during the summer recess and get a first-hand look.

We have attempted to tell you that we feel we have exhausted all private resources for future development, that we have the security necessary for the loan which we request, that we believe the resources which can be developed through the Fryingpan-Arkansas project will produce income enough to make repayment of the loan possible, for we want no charity. We know that in granting this loan you will enable us to create values which will be taxable by our local governments and create an additional income which will mean income tax revenues in excess of those presently received by the Federal Government, as well as repayment of the loan requested. We would also become much better customers of the other 47 States in the Union than we are today, through the creation of additional wealth and income. We also heartily feel that in this day and age of the atomic bomb, national-defense requirements warrant serious consideration of the development of this part of the country which is literally the best fortress which our Government can have.

In conclusion, may we emphasize that the water shortages of the Arkansas Valley in Colorado are not just a recent experience. Farmers and stockmen discovered 50 years ago that if they could get water on our land they could support a most abundant community. They spent many millions of dollars in developing their irrigation systems from the natural streamflow of the Arkansas River, but there was just not enough to go around every year and the fluctuations in the flow were too great. Those shortages produced great crop losses, but

still most of them persevered and firmed up every acre-foot of water that could be developed. They created a sound economy in spite of their shortages and risks, and the people continued to come to the cities and towns.

Industry has grown, transportation has grown, cities and towns have grown until today we not only have the problem of supplementing the natural flow of the river, but we must meet the demands of a progressive and live region. The shortage is now twofold. We are not only short of water for irrigation, but water for domestic and industrial purposes in our municipalities. That is double security for multiple-purpose usage. We solicit your approval and support in behalf of our region which can continue to grow only if it has the financial assistance we need.

Then, sir, with your permission, I would like to present for the record the statement of Harper Gardner, who represents the trustees of the two water districts in the city of Pueblo. Mr. Gardner was in the city last week. He and his wife were unfortunate enough to have an attack of nausea and had to return to Pueblo. We would like to have that made a part of the record.

Another statement by George Everett, who is president of the conservation district in the upper Arkansas Valley.

Statement by Harry C. Reese, secretary of the La Junta Chamber of Commerce, about the fifth or sixth largest city in our valley.

Statement by Milton H. Andrus, secretary of the Pueblo Chamber of Commerce, on behalf of that organization, the largest in the valley.

A statement by Harry Barnes. Mr. Barnes has served as consultant, in addition to his duties as city engineer at La Junta, for many of the small cities up and down the valley, and his statement covers many of the things which in one paragraph I tried to emphasize as to the dire need of those small communities for additional water and a steady supply.

Statement of Mr. John W. Beaty, vice president of our organization, who has lost his voice.

Then several resolutions here. I have 9 from chambers of commerce in our area, 2 from junior chambers of commerce.

A resolution from the Fort Lyon Canal Co., the Fountain Mutual Irrigation Co., the Farmers Luncheon Club of Colorado Springs, and the Colorado Soil Conservation Association, and the Upper Arkansas Soil Conservation District.

Statement from the Rotary Clubs of six cities in the Arkansas Valley.

Resolutions from the Southeastern REA, San Isabel REA, Sangre de Cristo REA, and San Luis Valley REA.

Statements from the Lions Clubs of nine cities in our valley or resolutions presented for your consideration.

The Elks Lodges, Pueblo Game and Fish Association, Business and Professional Women, and other civic organizations, the American Legion, and organizations of that type, also present resolutions.

Here are five resolutions from the Brotherhood of Railroad Trainmen, Pueblo United Labor League, Colorado State Federation of Labor, Congress of Industrial Organizations, and Colorado State Industrial Union Council.

Petition signed by many outstanding businessmen up and down the valley, asking consideration of the project.

Resolutions on behalf of the following cities enacted properly at meetings of their councils: Pueblo, Colorado Springs, Salida, Walsenburg, Poncha Springs, Las Animas, Florence, Canon City, Manzanola, Swink, Fowler, Buena Vista, La Junta, Rocky Ford, and Eads.

(Statements, resolutions, and other information follow:)

STATEMENT BY HARPER GARDNER CONCERNING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT PROJECT

For the purpose of identification, I am Harper Gardner; I have been a resident of Pueblo, Colo., for 56 years, and have been a trustee of the Pueblo Water Works, district No. 1, for 32 consecutive years. In my present capacity as trustee, I serve as treasurer, and during my 32 years as a trustee, I have acted as chairman, treasurer, and secretary.

That part of Pueblo, Colo., north of the Arkansas River is served by the Pueblo Water Works, district No. 1; that part south of the Arkansas River is served by Public Water Works, district No. 2. In discussing the dire need for the Fryingpan-Arkansas water development project, the following outline will consider the individual needs of both districts compiled as one, the needs of both districts being the needs of the entire city of Pueblo.

A municipal water supply, for the largest city as well as the smallest village, must have (1) a reliable source of supply, (2) sufficient storage facilities, and (3) a good quality of water. The proposed Fryingpan-Arkansas project makes these three requirements possible for the city of Pueblo, and are discussed in their sequence:

(1) Source of supply: The city of Pueblo depends almost entirely on the waters of the Arkansas River for its supply of municipal water. The decreed rights call for some 39,000 acre-feet of water annually, or some 52 cubic feet per second of time, provided there is that much water in the river to supply such amount. In 1934, the Arkansas River actually went dry, leaving the intake structures of the waterworks without a drop of water, placing the 50,000 people of the city of Pueblo in a catastrophic predicament. Working around the clock, wells were sunk to tap the underground waters of the Arkansas River, and by the narrowest margin, water was kept in the mains, tragedy averted. During the dry years which have followed, this incident has been repeated, but with the aid of the wells sunk in 1934, emergency measures have been inaugurated from time to time.

As recently as 2 years ago, an attempt was made to secure additional water for the city by purchase. The attempt failed due to a court decision. The city had an option to acquire certain water rights, and filed petitions in the district court to change the use of the water and to change the point of diversion to the city's intake structures. Hearings were held, but the petitions were denied, because it was the opinion that other appropriators would have been injured if the city's request had been approved. Thus the city has exhausted the possibilities of purchase or condemnation of existing agricultural rights and the necessary changes of points of diversion to make such acquisitions useful. If the purchases of water had been consummated (some very few have been made), it would have meant that the city would be legally entitled to more decreed water, while at the same time the farmland that was originally served by the purchased water would become a wasteland—a liability to the community and the Nation. But the sad part of this kind of a transfer is that there still is no more water in the river than there was before the change. Simply a change of use has been made, and a change of point of diversion.

In 1934, 50,000 persons in the metropolitan area faced a water famine. In 1952, 80,000 face this same water famine. The official census figures reveal a municipal population of 50,096 persons in 1930, and 63,561 persons in 1950. In addition to the municipal population, since World War II days, it has become necessary to serve the metropolitan area with water, this figure being officially noted in the 1950 census as being 77,000 persons. A conservative estimate of the 1952 metropolitan population is 80,000 persons.

Foreseeing the practical impossibility of obtaining additional water supply from the Arkansas River, in 1931 approximately 2,000 acre-feet of water per year, average, was purchased by Pueblo, transported from the Colorado River Basin, and diverted to the Arkansas River, for use by the city. This transportation is now being made by open ditches, and is the only supplemental water to the Arkansas River now available to the city. Surveys for additional Colorado River Basin waters have been under consideration for a number of years, but for the

most part have been held in abeyance pending the outcome of the Fryingpan-Arkansas project. This delay for the most part is to prevent the duplication of projects on the part of the city and the Bureau of Reclamation, should the project be consummated. The projects which the city has had in mind are comparatively small projects, none of which would be a complete solution to the problems involved, and would be a duplication in part to the overall plans of the Fryingpan-Arkansas project. It is further felt that it would be more desirable on the part of the city to secure a plentiful, firm supply of additional water, so as to safeguard an expanding population for a long time into the future, rather than relatively small projects which would serve only immediate needs, at a relative high cost to the city.

The city has been growing, and at present is continuing to grow at a rapidly expanding pace. New industries, additional expansion to existing industries, expansion of the Pueblo Ordinance Depot, accompanying large housing developments, both private and public, higher standards of living—all demand more and more water—water for domestic use, water for industrial use. Large sums have been invested in the installation of additional mains and pumping stations, mostly within the past 5 years. But the need for additional water supply has not been met, and cannot be met from the present source of supply. A conservative estimate of new water needed to keep pace with the normal expansion is between 18,000 acre-feet and 20,000 acre-feet of water per year, for possibly the next 10 years. This water must be water from the Colorado River Basin, as no further development of the Arkansas River waters is possible.

(2) Storage facilities: No matter how a municipality obtains its water, whether it be from underground or surface sources, this municipality cannot be deemed safe from drought and its ravages without an adequate storage system. Pueblo is no exception. The 2,000 acre-feet of water, average, transported from the Colorado River Basin, mentioned in (1), is presently stored in Sugar Loaf Reservoir of the Colorado Fuel & Iron Corp. The amount so stored varies in different years, depending on runoff conditions both on the Arkansas River and the diversion ditch itself. The right to store this water in the Sugar Loaf Reservoir is not firm, and is subject to be evacuated therefrom if water is available for storage therein for the purposes of the Colorado Fuel & Iron Corp. Knowing that the storage of the city water was not firm, surveys and studies have been made to provide storage facilities and have actually advanced to the stage of purchasing a reservoir site in the vicinity of Leadville, Colo. However, construction of the reservoir has been held in abeyance for the same reasons as advanced in (1), i. e. to prevent the operation of duplicate structures by the city and the Bureau of Reclamation, and to the detriment of both. This proposed reservoir by the city contemplates the storage of only 10,000 acre-feet of water. A conservative storage requirement for the city would be at least 1 year's supply, or 40,000 acre-feet of storage. This amount of storage would be prohibitive to construct from a cost standpoint by the city at the present time. The Fryingpan-Arkansas project amply provides the necessary storage facilities needed so desperately by the city, both for present and future demands.

(3) Quality of water: The quality of the domestic water supply should be greatly improved as a result of the project. Although the city's water supply is not what could be termed an exceedingly hard water, the introduction of new waters to the Arkansas River should dilute the existing waters, so that the hardness should be reduced to some extent. The presence of new storage reservoirs should settle out many of the suspended solids now carried by the river, and especially during floodtimes when the waters are exceedingly turbulent. By lessening the hardness of the waters, each individual water user within the city will benefit directly by decreased costs of plumbing repairs, less soap to purchase, etc. The decrease in suspended solids will mean a direct savings to the waterworks in treatment costs.

Summary: In conclusion, the city desperately needs an additional supply of water, both for present needs, and for future needs; the city needs storage facilities immediately, as demonstrated by the fact that the site has already been purchased, but construction withheld pending the outcome of the Fryingpan-Arkansas project; and finally, an improved water supply will result as a natural result of the project itself.

STATEMENT BY GEORGE E. EVERETT, SALIDA, COLO., CONCERNING THE PROPOSED FRYINGPAN-ARKANSAS WATER-DEVELOPMENT PROJECT

For the purpose of identification I, George E. Everett, would like to state that I was born and raised in Chaffee County, as was my father before me. My grandmother came to the county as a child. Her parents homesteaded within the area in the late 1860's. I am the fourth generation that has continually engaged in livestock and agricultural production within the county since that time. I am a member of the Farmers' Union, the Chaffee County Cattlemen's Association, the Colorado Cattlemen's Association, and I am a member of the school board of Adobe Park School, as well as being a member of many other organizations.

The area here under consideration which is utilized for agriculture and grazing, ranges in elevation from 5,330 feet above sea level to 10,500 feet above sea level, with the watershed extending on to 14,400 feet above sea level, consisting of 1,670 square miles of drainage area of which 6,700 acres are under irrigation and the balance is mountain meadow pasture and dryland pasture. The crops of this area consist of general agricultural crops such as mountain meadow hay, alfalfa, barley, wheat, and oats. These crops are used in production of livestock. The livestock raised is principally feeder cattle, feeder lambs, and purebred breeding stock.

The livestock industry at present is largely dependent on State and Federal forest lands for summer grazing, with winter feed being raised on the irrigated lands for the breeding herds during the winter months.

Shortage of irrigation water, causing decreased feed supplies, has resulted in excessive grazing of the private rangelands within the area, as well as excessive demands on the State and Federal forest lands for grazing purposes.

A supplemental water supply would result in the planting of more irrigated pasture, increased production of hay, and increased yields of oats, wheat, and barley.

Detailed farm budgets prepared for this area under a cooperative study sponsored by the Southeastern Colorado Water Development Association have shown that loss in gross crop sales varies from $13.33 to $22.57 per acre. Assuming that $15 per acre would represent a conservative average the total loss in crop sales could well amount to $1 million per year.

The Fryingpan-Arkansas project, creating additional water, will make possible the reorganization of many of the ditch systems now existing in this area. To illustrate this point, during the irrigation year 1942 there was approximately 255,000 acre-feet of water diverted in water district 11, which includes Lake and Chaffee Counties.

On the average 50 percent of the water is lost in the ditches before it reaches the land where it is to be applied. This means that 127,000 acre-feet of water is lost, so far as crop production is concerned. A very conservative estimate would show that approximately 20,000 acre-feet of this water can be saved as a result of water exchanges, consolidation of innumerable small ditches, and utilization of the project canals as a transportation facility. These savings are dependent entirely on the agreements among the irrigators and the Bureau of Reclamation where their facilities are involved.

Construction of this project will stimulate production of intensive agricultural crops and dairy products during the construction period. It is realized that this is only temporary and is not considered in estimating the agricultural losses accruing in the area.

It is my opinion that this project is of vital importance to the entire Arkansas Valley and should be authorized and completed as soon as possible.

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STATEMENT BY HARRY C. REESE SUPPORTING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT PROJECT

I am Harry C. Reese. I have been a resident of Colorado since 1946. From 1947 to 1950 I was manager of the chamber of commerce at Florence, Colo. Since 1950, I have been manager of the chamber of commerce at La Junta, Colo. I am a graduate of Fenn College, Cleveland, Ohio, and of the Southwestern Chamber of Commerce Institute, Dallas, Tex. I am an active member of the Colorado State Chamber of Commerce Manager's Association and of the Mountain States Association of Chamber of Commerce Managers.

My specific purpose in appearing before you is to represent the community development in 10 of the smaller communities located in the Arkansas Valley.

The position of the two metropolitan areas located in the project area—Colorado Springs and Pueblo—will be represented by other speakers.

The 10 communities which I am representing are Leadville, Salida, Canon City, Florence, Walsenburg, Fowler, Rocky Ford, La Junta, Las Animas, and Lamar. These towns are strung out over an area that is approximately 300 miles in length from Leadville on the west, located near the headwaters of the Arkansas River to Lamar on the east located 32 miles from the Colorado-Kansas line.

From the census figures in 1930 these 10 communities had a total population of 41,051. By 1940, these communities had an increase in population of 3,002, for a total of 44,053. By 1950, this population had increased to 50,777 or an increase of 6,724 over the 1940 figures.

The introduction of supplemental water into the Arkansas Valley in the proposed Fryingpan-Arkansas project affects our area in two ways. First, let me discuss with you the effect upon the living conditions of our people by giving you a picture of the present situation and the anticipated improvement with supplemental water.

We are seriously short of domestic water in our towns. West of Pueblo, communities depend on streamflow diversions or mountain watersheds for municipal use. East of Pueblo, supplies are largely from shallow wells. These latter communities have storage facilities equal to 1 day's supply or less. Pumping capacities are taxed to the limit during the period of June through September. In the summer months, municipalities maintain a constant and desperate struggle to keep water supplies in line with peak demand.

During the 4-month period of peak demand drastic restrictions are placed on domestic users. The use of water for lawns and gardens is banned during most of the day in this period, so that adequate supplies will be available and line pressure maintained.

While the quality of the water in 5 of the communities west and south of Pueblo is not too bad, the other 5 towns have supplies with excessive sulfates resulting in water that averages about 50 grains hardness per gallon.

This hard water causes an equal burden to the housewife, the municipality and the industrial user. To be satisfactory for household use, this water must be treated or the soap bill soars, the dishes are streaked, the clothes not clean, and the scrubbed floors spotted.

It is common in this area for domestic users to purchase water from commercial wells in order to get a reasonable supply of soft water for household use. This water, stored in cisterns, is often hauled for several miles at an average cost of $5 per thousand gallons.

In city mains, this hard water causes serious encrusting and rapid deterioration of pipes. Waterline breaks, valves that are eaten out are all costly to municipal operations. The industrial user is plagued in the same manner in his boiler systems and in his processing water. The cost of building a treating plant to render the water acceptable for industrial use very often is equal to the cost of building and equipping the plant itself.

With the availability of supplemental water for domestic use, a large share of the problems of lack of municipal water supply and lack of quality water would be eliminated. The use of the proposed Pueblo Reservoir for the storage of municipal supply would overcome the present lack of storage.

The availability of quality water of 4 to 6 grains hardness per gallon chlorinated in the proposed Pueblo treating plant and made available by pipeline to the towns east of Pueblo would far surpass the quality of the present supply.

The need for a supply of quality water for human consumption is paramount. We are short of this water now. Our population is on the increase. We strongly feel that the development of additional domestic water in the Fryingpan-Arkansas project is necessary to maintain our present population level and allow us a normal rate of growth in our communities.

The second effect of the introduction of supplemental water is in the economic pattern of the area. Basically, this is an agricultural area. Farming and ranching, irrigated and dry land, extends the length of the valley and is the basic structure of the area.

With this economy, the processing of agricultural products is important. The refining of sugar beets, canning of fruit and vegetable crops, feeding and processing of livestock, the production of animal feeds, and organic fertilizers, and recently the new development of chlorophyl extraction are all important operations in the communities of the area.

Raw materials available in the area play a strong part, too. Within the region are deposits of feldspar, fluorspar, lead, zinc, manganese, gold, silver, nonmetallics,

oil, and coal. Many of these raw materials are in various stages of productive development, others are virtually dormant.

Colorado's tourist business, a $220 million operation in 1951, is of much importance to the Arkansas Valley area. For upon it depends thousands of small independent businessmen. Motel and resort operators, filling stations, restaurants, sports dealers and many others make the livelihood from those who come to see and enjoy Colorado's majestic peaks and scenic beauty.

Each of these economic phases is important to the well being of our area. Each phase suffers and is limited by water supply and quality.

The increased efficiency of existing irrigation ditch systems can only be brought about by supplemental water. The urgent needs for domestic water and for industrial water have been filled at the expense of agriculture. Limited crops and low yields are an old story to our farmers. Droughts, low-runoff periods, and overappropriated water rights all take their toll of agricultural production.

National markets for high quality Colorado grown products such as sugar beets, onions, cantaloupes, vegetables, seeds, and alfalfa meal already exist. With supplemental water, Arkansas Valley farmers can grow higher cash value crops and increase their yields of the existing crops. This is sound development and it will materially strengthen the economic basis of the entire region.

The production of fine Colorado beef, lamb, and turkeys is on the increase and finds a ready market throughout the Nation. Increased feed supplies in the project development will greatly enhance this type of foodstuff production necessary to a growing national population.

Strategic minerals and nonmetallics processed in the project area are now limited by lack of power and water. The major production is in copper, lead, zinc, gold, and silver. Other metal development prospects are in aluminum, bismuth, cadmium, iron, manganese, molybdenum, and nickel.

Among the producers, the Reynolds Mining Co. in the Salida area indicated that their fluorspar operations will be limited in the near future by lack of water and power. The Resurrection mining group in the Leadville area in their production of lead, zinc, and other strategic metals will be hampered to some extent by water but mainly by lack of power.

Coal is a large resource in the Walsenburg, Florence, and Canon City area. The trend toward the use of coal in high-temperature processing for byproduct extraction and the production of synthetic fuels is rapidly coming upon us. To develop these large deposits of both high- and low-grade coals, supplies of water and power must be available.

There are instances of existing industry being limited by the lack of quality water. Canning plants in the area are hampered both by the lack of agricultural water as well as the lack of a quality supply for processing. Sugar beet companies have been faced with water shortages in the midst of their processing campaigns in the fall. The Santa Fe Railroad at its division point in La Junta treats 61 grain water to 1 grain hardness on an average of over 7 million gallons per day. A savings of thousands of dollars annually would occur if a better quality water were available.

The availability of quality water and hydroelectric power from the proposed Fryingpan-Arkansas project would stimulate the expansion of vast mineral resources in the area. Existing industry unhampered by the lack of water and power would expand and develop at rate consistent with market demands.

With supplemental water and power bringing increased agricultural yields, greater livestock production, expansion of industry, and raw-material development a far broader taxing base would come into being in the project area. The increases to local and State taxing units, along with the enhancement of Federal tax receipts, would come as a natural result of the project development.

The tourist business, an important facet of our area, would receive a tremendous boost in both eastern Colorado and western Colorado from the development of the recreational features of the proposed project. It is important to note that this project is the first in Colorado to be planned with the full cooperation of Federal, State, and local fish and wildlife interests. Thousands of independent small-business men who work to serve the tourist industry will be directly benefited as the project materializes.

To summarize: The Arkansas Valley has been and is now seriously short of domestic, agricultural, and industrial water. The importation of surplus water from western Colorado to our deficient area in eastern Colorado is our only feasible means of acquiring water to maintain our living conditions and economy.

Through their association together and through the proposed formation of conservancy districts, the people on our area have demonstrated that they are

willing to repay a large share of the project costs through the purchase of water and the purchase and sale of power.

For the people of the Arkansas Valley, first and foremost, additional water is a must. To expand and develop industry and natural resources, supplies of quality water and available power are a just. If our area is to maintain the existing economy, to better our living conditions and to expand to a maximum development to take our place in a strong healthy Nation, we earnestly request that you give every favorable consideration to the early construction of the Fryingpan-Arkansas project.

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STATEMENT BY MILTON H. ANDRUS SUPPORTING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT PROJECT

I am Milton H. Andrus. I have been a resident of Colorado since 1930. From 1946 to 1949 I was manager of the Chamber of Commerce of Canon City, Colo. Since that time I have been manager of the Chamber of Commerce of Pueblo, Colo. I am a graduate of Colorado State College of Education at Greeley, Colo., and of both the Rocky Mountain Chamber of Commerce Institute, at Missoula, Mont., and the National Institute of Chamber of Commerce and Trade Organizations at Northwestern University, Evanston, Ill. I am an active member of the Colorado State Chamber of Commerce Manager's Association, of which I am a past president, and of the Mountain States Association of which I am currently president. For the past 3 years I have been, and will continue to be, a member of the Colorado State Planning Commission. This group has to do with statewide planning in many areas, but especially for the 23 institutions maintained by the State. My purpose in appearing before this group is to represent the business and commercial interests of Pueblo, Colo., in presenting the desperate need for more water to supply the municipal, industrial, especially from a defense point of view, and commercial development of this pioneer western city.

*Essential economic data, Pueblo, Colo.*

Pueblo is an historic commercial and trading center. It has been since the 1600's when the Spaniards first began to come into this area. Located as it is and at the confluence of the Fountain and Arkansas Rivers, it has been a crossroads of commercial traffic since its very beginning. As the white man came into the area, Pueblo took on permanent form and began to develop. It is interesting to note that the growth of this famed industrial city of the Rocky Mountain West has always been governed by the limiting factor—water.

In the days of 1849 the present site of Pueblo was a trading place for Indians and white trappers of the then perilous frontier. However, by 1870, the trading advantages of the Pueblo location had brought about a settlement of some 500 persons and they incorporated the struggling community as a town. About 1872, the Denver and Rio Grande Western Railroad made its appearance in the Pueblo area and some 15 years later, they were followed by the Atchison, Topeka & Santa Fe, the Colorado & Southern, and the Missouri Pacific.

In 1879 the present Colorado Fuel & Iron Corp. was incorporated and Pueblo's strategic location won for it, selection as the site of the first western steel mills. Within the next few years the smelters came to Pueblo as Colorado's mining industry reached its zenith. The smelters, of course, disappeared from the scene when the economy of the country made some mining impractical, but the steel mills continued and other industries have come to join the industrial community of Pueblo until today it has become a city of many manufacturers and processors, a railhead of national importance, center of airline activity, and a focal point for more than a score of truck and bus lines.

As the years have come and gone, Pueblo has developed only as rapidly as water has been developed. Today, this city is playing an increasingly important role in the defense of our country, as well as in the normal growth of the Rocky Mountain West.

Since 1940 Pueblo has grown at a much more accelerated rate than was dreamed possible and to go forward serving this region and the Nation effectively, more water and more power must be developed.

There have been many interesting and effective economic developments outside the field of prime industry as Pueblo has grown. This city has become the center of a wholesale trade area populated by some 600,000 people and a retail area inhabited by 200,000 people. Pueblo has become the key city of the region being

the major community located on the Arkansas River within the great State of Colorado.

*Physical location of Pueblo, Colo.*

Geographic: Latitude, 38'16'' north; longitude, 104'36'' west; altitude, 4,690 feet.

Pueblo is located in southeastern Colorado at the foot of the Rocky Mountains. Geographically it is somewhat west of the center of the United States but from the standpoint of transportation it is practically the center. The terrain has a gradual eastern slope averaging 10 feet to the mile. Pueblo is the major city in the Arkansas Valley within the State of Colorado. The valley is the home of a vast agriculture industry that is greatly diversified ranging from a stock-feeding industry to the production of seed, fruits, and vegetables. This community is also the gateway to eastern and southern tourists seeking the scenic grandeur and tremendous recreational advantages of the Colorado Rockies. However, the city is primarily an industrial and commercial one. Its growth has been steady, but the rate of growth has been greatly accelerated during the past 10 years due to the war effort and would have grown even faster had it not been for the ever-present and limiting factor of water. Today Pueblo is playing a tremendous part in defense production as well as being the key to normal growth throughout the Rocky Mountain region. If Pueblo is to continue to grow and therefore to be more useful to the Nation and the region, the development of more water and the creation of more power for the future must be carried on as rapidly as possible. The locality's climate is best presented by the following excerpts from United States Weather Bureau records:

Average mean temperature: 51.9° F., 60 years of record.
Average annual precipitation: 11.89 inches, 60 years of record.
Average annual snowfall: 29.1 inches, 60 years of record.
Average annual sunshine percentage: 74, 49 years of record.
Average relative humidity (11:30 a. m.): 37 percent, 31 years record.

Pueblo is the most northern city in the winter sunshine zone. It's year-round climate fosters maximum labor efficiency and encourages constancy of labor supply. Local industries list the moderate climate as one of the most important assets in their operation. The Pueblo Ordnance Depot finds the combination of 9 hours' average sunshine, low humidity, and high altitude ideal for storage and maintenance of vehicles, machines, tools, guns, and ammunition.

Water supply is from the Arkansas River and standby wells.

Two municipally owned and operated water districts serve the city. Water is given full treatment, including chlorination before entering mains. Its source is the nearby Rocky Mountains which furnishes good water, ranging in quality from 12 to 20 points of hardness.

*Population*

| Year | Pueblo County | Pueblo City | Metropolitan area |
|---|---|---|---|
| 1890 | 31,491 | 24,558 | |
| 1900 | 34,448 | 28,157 | |
| 1910 | 52,223 | 41,747 | |
| 1920 | 57,638 | 43,050 | |
| 1930 | 66,038 | 50,096 | |
| 1940 | 68,870 | 52,162 | 62,039 |
| 1950 | 90,188 | 63,685 | 82,500 |

Metropolitan population has been recently added because of the large growth and development just outside the present city limits.

Note that the population city of Pueblo increased 21 percent in the last 10 years with an even greater increase in the metropolitan area.

*Population classification, Pueblo County, 1940—All classes*

| | Male | Female | Native white | Foreign born white | Negro |
|---|---|---|---|---|---|
| Population | 34,516 | 34,354 | 61,561 | 5,889 | 1,420 |
| Percent | 50.2 | 49.8 | 89.4 | 8.4 | 2.1 |

*Comparative business index—Retail sales*

| Net sales: | | Net sales—Continued | |
|---|---|---|---|
| 1933 | $13,693,000 | 1947 | $75,700,208 |
| 1935 | 16,507,000 | 1948 | 111,673,716 |
| 1939 | 22,800,000 | 1949 | 114,000,000 |
| 1941 | 27,977,000 | 1950 | 114,776,000 |
| 1942 | 31,334,000 | June 30, 1950, to June 30, 1951 | 137,881,000 |
| 1945 | 41,040,000 | | |
| 1946 | 53,755,000 | | |

STATEMENT IN SUPPORT OF THE FRYINGPAN-ARKANSAS PROJECT

My name is Harry Barnes. I have been a resident of the Arkansas Valley for 30 years. For the past 15 years I have held the position of city engineer for the city of Rocky Ford. I am State chairman of the Colorado Municipal Highway Committee. I have held various offices in the American Water Works Association. During the past 15 years I have been in complete charge of the municipal water works for the city of Rocky Ford. During that time I have rendered some engineering service to practically all of the smaller towns of the Arkansas Valley and through this service have become familiar with about all of their water problems. Also, through association with other municipal officials, I have learned to understand the problems encountered by the cities that employ their own engineers.

When towns were founded in this area, water, from the first day was the major problem. Shallow wells, for the most part, were found to produce a water that was so hard and so alkaline in nature that it could not be used sat'sfactorily. Municipalities then went to artesian wells. At depths ranging from 750 feet to 1,200 feet they obtained a very limited supply of very soft water. Even then many of these wells carried such an extent of iron that some treatment was necessary. Within a few years most communities outgrew the supply these wells furnished. It was then necessary to go in search of surface supplies or to use the extremely hard shallow wells. Those towns that have stayed with the deep wells have been forced to restrict building, with the ultimate result that many of them are smaller than they were 20 years ago.

Actually, gentlement, we have some residents of every town and city in the valley, as well as all of the country population, who are forced to haul all of their domestic water. In many instances it is necessary to haul this water several miles. The average price paid for this water is $5 per each thousand gallons. Many homes in the valley have no means of sewage disposal caused by a lack of water to flush toilets. This in many areas does not point toward a modern sanitary condition.

The climate of the Arkansas Valley is of a semiarid nature. The annual rainfall is from 11 to 16 inches. This is too little to let most plants exist. Irrigation is necessary for us to have lawns in our towns and cities. And I believe that you will agree that lawns and gardens are necessary for modern living. The fact that irrigation is necessary makes our daily per capita use of water run from 200 to 450 gallons.

Another bad feature of the water situation in all of the valley municipalities is the fact that no storage exists. No town or city east of the proposed Pueblo Reservoir has any storage. By that I mean, when the pumps stop there is nothing to fall back on. Take our small community whose only supply is a 1,200 foot well. Suppose a shortage of power or a well casing failure should stop production of that one well. A city without water could very easily become a city where disease could run rampant. The large city tries never to have less than a 6-month supply in storage. Please compare that with the situation that exists in our valley.

Below we are going to present very briefly to you the names of the towns and cities which would be affected by the Frying Pan-Arkansas project. In this I am going to show the present source of domestic water, the population served and the hardness of the present supply. Please observe that each community would be affected in a different way, but every community would be benefited.

Salida, Canon City, and Florence: All being located at high altitudes along the Arkansas River all derive a very nice water from that river. The diversion plan would benefit these cities in that with a higher river they would have a more ample supply at all times of the year. The total population of these three towns is approximately 15,000.

Fowler: Is presently supplied from natural springs. Hardness is 10 grains per gallon. Population is 1,025. This town has made no application for additional water. Most of their citizens know that any increase in population would necessitate more water. The springs are running at full capacity at the present time.

Manzanola: Obtains its water from a depth of 1,200 feet. The water is reasonably soft but contains sulphates to such an extent that it is eating up the distribution system. They have barely enough water to supply present needs. Residential building has been curtailed for many years. A major failure in a well casing would put the town out of water for months.

Rocky Ford: Serves a population of around 5,000 people. Obtains its present supply from the Arkansas River. Has a filtration plant and because of the highly polluted raw water it is forced to a very expensive treatment procedure. Hardness averages about 30 grains per gallon. When the river is low they are forced to pump their entire supply three times.

La Junta: Serves a population of about 8,000. Present supply is obtained from the bed of the Arkansas River. Hardness is around 57 grains per gallon. Too hard for the commercial water softener to handle. The city has been greatly handicapped by the hardness of the water.

Las Animas: Serves a population of around 4,000 persons. Water is taken from shallow wells. Hardness is 78.5 grains per gallon. Imagine, gentlemen, trying to live with a water supply that hard.

Lamar—serves a population of 8,000 persons. Present supply is a combination of wells and surface water from Clay Creek. Hardness is around 21 grains per gallon. As long as the surface does not lower the city feels that it will continue to have an ample supply of only fair water.

Swink—serves about 400 people. Obtains water from a well 735 feet deep. Supply is very limited. Residential building is prohibited. With better and more water the town would grow. A large sugar factory located here is forced to supply its own water, for both its residences and for its operation.

Eads—serves a population of about 1,200. Gets a very limited supply of water from two deep wells. Supply is used for domestic water only. The watering of lawns is usually prohibited. Growth is limited because of the shortage of water. Another instance where a major breakdown could put the town out of water for months.

Wiley—serves about 450 persons. Water is obtained from the Arkansas River. They have about a 800,000 gallon reservoir and a small high pressure filtration plant. When the river is low for a long period of time and the ditch from which they receive their supply is out of water the town is out.

Crowley—a small community of about 300 persons. Water supply is from shallow wells. Supply is very limited and water is extremely hard. This community has not had a chance to expand over the years because of their being unable to furnish an adequate supply of water to the inhabitants now there—let alone any new population.

Ordway—serves a population of about 1,200 persons. Water is derived from better than average wells. The town has a reservoir which holds about a 20-day supply. The town also has a softening plant. At present is doing very well if the ground water supply holds up they, with no increase in population, are in a fair shape for domestic water.

Thus, gentlemen, we have shown you a brief résumé of 14 communities, who serve some 44,000 persons. These communities have, in the past years, spent literally millions of dollars, acting upon the best engineering ability available, to do the best that could be done in the way of providing as much water and as good a water as could be had. Only in very rare instances can it be said that these millions have been spent wisely, because we are still short of an adequate supply of soft healthful water. We in the Arkansas Valley, are fully aware of the fact that our towns and cities never become any larger than their water supplies. We

also feel that a price cannot be placed on the most precious commodity the world possesses, namely an adequate supply of soft pure water.

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STATEMENT OF FRYINGPAN-ARKANSAS PROJECT SUBMITTED BY JOHN W. BEATY

I, John W. Beaty, of Manzanola, Colo., hereby urgently recommend the immediate authorization of the Fryingpan-Arkansas transmountain diversion.

For purposes of identification, I desire to say that I was born in Manzanola, Colo., in the Arkansas Valley, of pioneer parents, who took part in the building of the agricultural, stock raising and irrigation business of the valley. My parents and relatives were farmers, livestock breeders and feeders, merchants, businessmen and bankers who founded the town of Manzanola.

I have lived in Manzanola ever since the date of my birth, where I have agricultural, livestock, mercantile and bank holdings, as of this date. I am now a member of the following organizations, among many others: The Colorado Water Conservation Board; the Arkansas Valley Ditch Association; and a director of the Manzanola School District.

I am president and manager of the Catlin Canal Co., which operates the Catlin Canal, which irrigates approximately 18,770 acres of land in the Arkansas Valley.

Space only permits reference to a few reasons why the said transmountain diversion ought to be immediately authorized. Except for small ditches and the ditches of the upper Arkansas Valley, there are 23 ditches all below Portland, Colo., which irrigate approximately 306,000 acres of the total of 322,000 acres of land irrigated from and on the main stem of the Arkansas River.

Thirteen of these ditches have requested and do now urgently need a supplemental supply of approximately 175,500 acre-feet of water per annum, in addition to their present supply obtainable from the Arkansas River. The names of these companies and the respective amounts of supplemental supply which they would be willing to take from the Fryingpan-Arkansas diversion, if the terms and payments therefore shall be satisfactory, are:

| | *Acre-feet* |
|---|---|
| The Fort Lyon Canal Co | 75,000 |
| The Fort Bent Ditch Co | 5,000 |
| The Bessemer Irrigation Ditch Co | 10,000 |
| The High Line Canal Co | 15,000 |
| The Otero Irrigation District | 15,000 |
| The Catlin Canal Co | 3,000 |
| The Rocky Ford Ditch Co | 1,000 |
| The Amity Mutual Irrigation Co | 25,000 |
| The Lamar Canal and Irrigation Co | 2,000 |
| Koesee Ditch | 1,000 |
| Colorado Fuel & Iron Co | 1,000 |
| Excelsior Irrigation Co | 2,500 |
| Holbrook Irrigation District | 20,000 |
| Total | 175,500 |

The proceeds from the annual sales of crops produced from Leadville along the main stem of the Arkansas River amount to about $16 million. The proceeds from the annual sales of livestock in the same area amount to about $11 million, or a total of $27 million for both crops and livestock.

The annual crops losses estimated to be suffered due to water shortage in the above area amount to about $5 million. The annual livestock production loss in said area amounts to about $2 million, or a total loss of livestock and crops of about $7 million.

I am sure that 50 percent of the amount of the foregoing losses would be eliminated by additional, or supplemental, water which will be made available under the Fryingpan-Arkansas River project.

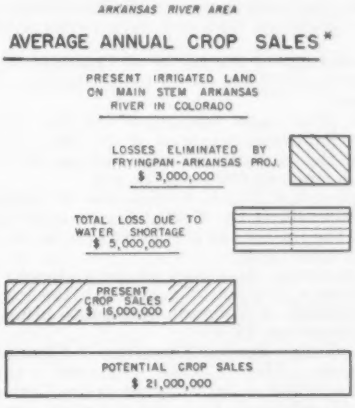
Another very important handicap resulting in financial loss, as well as tremendous loss in the general health and living standards of the residents of the agricultural area of said valley, occurs because of the shortage, and in some instances entire lack, of wholesome domestic water supply. Most of the residents in the agricultural area now have to haul their water in tank wagon lots to cisterns located at their homes. The water is then taken from the cisterns for all domestic and household uses.

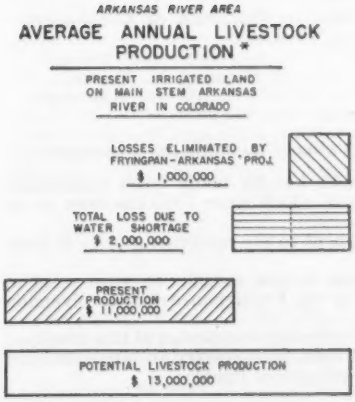
This often results in contamination and disease which is very expensive, not to mention the suffering and sometimes death, caused thereby.

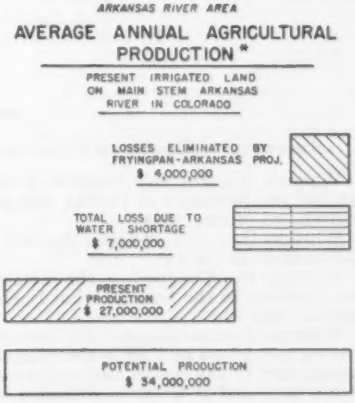
In addition, in much of the area, livestock is watered with muddy and unwholesome surface water and from surface wells which are highly mineralized. This greatly increases the loss and reduces the productivity of the livestock industry of the area.

Countless other reasons could be entered for the authorization of this sorely needed diversion. Many of them will be presented by other persons, but the fact remains that one of the richest and one of the most livable localities in this or any other Nation is severely crippled and handicapped at the present time with a lack of ample, wholesome and controlled water.

This project should be authorized and completed with all convenient speed.


ARKANSAS RIVER AREA
AVERAGE ANNUAL CROP SALES *
PRESENT IRRIGATED LAND ON MAIN STEM ARKANSAS RIVER IN COLORADO
LOSSES ELIMINATED BY FRYINGPAN-ARKANSAS PROJ. $ 3,000,000
TOTAL LOSS DUE TO WATER SHORTAGE $ 5,000,000
PRESENT CROP SALES $ 16,000,000
POTENTIAL CROP SALES $ 21,000,000
* Yields are average for period of 1931-1944.
Prices are average for period of 1946-1951.


ARKANSAS RIVER AREA
AVERAGE ANNUAL LIVESTOCK PRODUCTION *
PRESENT IRRIGATED LAND ON MAIN STEM ARKANSAS RIVER IN COLORADO
LOSSES ELIMINATED BY FRYINGPAN-ARKANSAS PROJ. $ 1,000,000
TOTAL LOSS DUE TO WATER SHORTAGE $ 2,000,000
PRESENT PRODUCTION $ 11,000,000
POTENTIAL LIVESTOCK PRODUCTION $ 13,000,000
* Yields are average for period of 1931-1944.
Prices are average for period of 1946-1951.


ARKANSAS RIVER AREA
AVERAGE ANNUAL AGRICULTURAL PRODUCTION *
PRESENT IRRIGATED LAND ON MAIN STEM ARKANSAS RIVER IN COLORADO
LOSSES ELIMINATED BY FRYINGPAN-ARKANSAS PROJ. $ 4,000,000
TOTAL LOSS DUE TO WATER SHORTAGE $ 7,000,000
PRESENT PRODUCTION $ 27,000,000
POTENTIAL PRODUCTION $ 34,000,000
* Yields are average for period of 1931-1944.
Prices are average for period of 1946-1951.

RESOLUTION REGARDING FRYINGPAN-ARKANSAS RIVER DIVERSION PROJECT

Whereas there will be considered by the Congress of the United States the matter of providing necessary funds to carry out the important Fryingpan-Arkansas water diversion project; and

Whereas the use of this water is essential to the development of the upper Arkansas River Valley and its tributaries, of which this community is a part; and

Whereas the human, commercial, industrial, and agricultural needs of the Arkansas River Valley are a matter of prime concern to the people of the Pikes Peak region; and

Whereas 77,000 people, living within the contiguous area of Colorado Springs and the Pikes Peak region, are much concerned about the future of the water supply of this area for purposes above enumerated; and

Whereas the gainfully employed persons of the Pikes Peak region have increased from 26,500 in 1948, to 32,500 in 1952, and show evidence of continued increase; and

Whereas the bank clearings of the banks of Colorado Springs have increased from $54,290,000 in 1942 to $177,398,000 in 1952, which is evidence of continuous commercial growth; and

Whereas the bureau of business research of the University of Colorado, in a prepared report on the industrial potential of the Pikes Peak region, estimates that the population of the city of Colorado Springs alone, irrespective of its contiguous territory, will reach 75,000 by 1960; and

Whereas there is located in Colorado Springs the Air Defense Command of the United States, the antiaircraft of the United States, and Camp Carson, with an area of 63,000 acres for the training of ground troops, all of which partake of the water resources of this region; and

Whereas the water resources committee of the Colorado Springs Chamber of Commerce has worked for a number of years with the leaders of the Arkansas River Valley and civil officials of Colorado Springs, to bring about an increase of water resources: Now, therefore, be it

*Resolved*, That the Colorado Springs Chamber of Commerce, by action of its board of directors, Thursday, May 14, 1953, do appeal to the proper officials and agencies of the Government and of the Congress of the United States to take such necessary steps to provide adequate funds for the work necessary to bring about the completion of hte Fryingpan-Arkansas River diversion project: Further be it

*Resolved*, That a copy of this resolution be prepared and presented to all interested parties, done this 14th day of May 1953.

THE COLORADO SPRINGS CHAMBER OF COMMERCE,
By W. HENRY WILLIE, *President.*

Attest:

HOWARD N. YATES,
*Secretary-Manager.*

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RESOLUTION, BOARD OF DIRECTORS, PUEBLO CHAMBER OF COMMERCE

Whereas the Pueblo Chamber of Commerce has for many years continually studied the problems of Pueblo, the growth of which since 1940 has been at an undreamed of rate; and

Whereas they now find that the only detriment to the continual growth at such accelerated rate is water; and

Whereas the Congress of the United States is now considering vital relief of this problem in the form of what is known as the Fryingpan-Arkansas diversion project; and

Whereas the enactment of this law and the ultimate completion of this proposed project will afford to Pueblo the lifegiving element so necessary to our continued growth and to the health and welfare of the citizens of Pueblo;

*We, the board of directors, do hereby*

*Resolve*, That the Congress of the United States give due and careful consideration to the authorization of this project which will be of untold benefit to the citizenry of Pueblo as well as to all Colorado thereby benefiting this great Nation as a nation: Be it further

*Resolved*, That the Secretary be instructed to transmit this resolution of the Senators and Congressmen in the Congress of the United States now in session and to the committee of Congress now considering the herein mentioned project.

PUEBLO CHAMBER OF COMMERCE,
HOWARD EMMONS, *President.*
MILT ANDRES, *Secretary.*

RESOLUTION

Whereas the communities and citizens of the Arkansas Valley in Colorado have spent many years of effort to increase their water supply, both for domestic use and irrigation; and

Whereas the proposed Fryingpan-Arkansas transmountain water diversion project will increase the vital supply of water to our people and lands; and

Whereas the badly needed water will allow increased production of high-grade agriculture products, and will allow expansion of the processing of natural resources, and increase industrialization through increased water supplies and electric power generation; and

Whereas all of these factors are vital to the national-defense program and the internal strengthening of our country: and now, therefore

The La Junta Chamber of Commerce does favor and urge the immediate construction of the Fryingpan-Arkansas transmountain water-diversion project.

THE LA JUNTA CHAMBER OF COMMERCE, INC.,
SELDON O. JEFFERS, *President.*

Attest:

HARRY C. REESE, *Secretary.*

MARCH 4, 1952.

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RESOLUTION OF THE SALIDA CHAMBER OF COMMERCE, ADOPTED THIS 19TH DAY OF MAY 1953

*To the Honorable Members of The House of Representatives, and the Senate of the Congress of The United States of America:*

Whereas the members of the Salida Chamber of Commerce do by this resolution heartily endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material genefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas, by making available more water for irrigation in these States, and more power to operate industries, businesses, and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to the sections where adequate water and power is available, and the resultant water and power from this project will be sufficient to accommodate such industries: and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business; all of which can be derived from the increased water and power from this project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas project is too great to be defrayed by State or private interests: Now, therefore, be it

*Resolved by the Salida Chamber of Commerce,* That the accomplishment of this diversion project is in the best interest of our Nation, and the Salida Chamber of Commerce does urge that our Representatives and Senators in the Congress of the United States give earnest consideraton in the immediate passage of the Fryingpan-Arkansas River diversion bill.

WALTER E. BURLESON,
*President.*

Attest:

CHARLES L. THOMSON, *Manager.*

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RESOLUTION OF THE WATER (RECLAMATION) COMMITTEE OF HUERFANO COUNTY CHAMBER OF COMMERCE, PROPOSED TO THE CHAMBER BOARD, ADOPTED, AND PRESENTED TO THE BOARD OF COMMISSIONERS OF HUERFANO COUNTY

Whereas the work and progress of Water Development Association of Southeastern Colorado in the Fryingpan-Arkansas diversion project have been steady and forthright and the project is now practically ready for congressional action; and

Whereas the relations and the welfare of Huerfano County are in definite contact with Pueblo and the Arkansas Valley; and

Whereas the undoubted favorable effect upon the Arkansas Valley in the final success of the movement deeply concerns Huerfano County in the demand of the valley for our coal production; and

Whereas when all this becomes a reality the increased population and added economy, the impetus thereof would reflect definitely and favorably upon our own economy in this county; and

Whereas the recession in coal mining has been such in this county as to justify our own foresighted effort and objective so akin to this project; and

Whereas Huerfano County did, in the beginning and since, lend its financial as well as its personal and moral backing to the work of the Water Development Association of Southeastern Colorado, and has always been represented on its board of directors and its advisory committee, thus recognized and participating in full consideration in the official work of the association: Therefore be it

*Resolved*, That Huerfano County Chamber of Commerce respectfully requests the board of commissioners of Huerfano County to make such appropriation as it feels possible, to further the work of the development association in its final struggle for results.

This resolution is recommended to the board of this chamber by the water committee.

JAMES H. P. FISK, *Chairman.*
CECIL D. CALDWELL.
GEORGE S. NIEBUHR.
PHILIP B. MILES.
RALPH H. FAXON.

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RESOLUTION OF THE BUENA VISTA CHAMBER OF COMMERCE, ADOPTED THIS 20TH DAY OF MAY 1953

*To Honorable Members of the House of Representatives and the Senate of the Congress of the United States of America:*

Whereas the members of the Buena Vista Chamber of Commerce do by this resolution endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas by making available more water and power to operate industries, businesses and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to sections where an adequate supply of water and power is available, and the resultant water and power from this project will be sufficient to accommodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business, all of which can be derived from the increased water and power from the project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas River project is too great to be defrayed by State or private interests: And now, therefore, be it

*Resolved by the Buena Vista Chamber of Commerce*, That the accomplishment of this diversion project is in the best interest of our Nation and the Buena Vista Chamber of Commerce does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

Attest:

FLOYD E. SASS, *President.*
DOROTHEA WILLE, *Secretary.*

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RESOLUTION—CHAMBER OF COMMERCE, CANON CITY, COLO.

Whereas Colorado is richly endowed with natural resources as: fertile land and and abundance of mineral wealth beneath the soil: and

Whereas the population of Colorado is increasing at a phenomenal rate; and

Whereas the continued development of the aforementioned resources, and welfare of the mass population are dependent upon the key resources—water; and

Whereas there is now before the Congress of the United States a bill to construct the Fryingpan-Arkansas project, which said project will develop, conserve, and make available for consumptive use an amount of water now absolutely necessary and positively needed in the valley of the Arkansas River: Now, therefore, be it

*Resolved*, That the Canon City Chamber of Commerce does hereby respectfully urge the Colorado congressional delegation to take all action proper and necessary to secure congressional authorization of the Fryingpan-Arkansas project.

B. FRANK WARD, *Manager.*

MAY 19, 1953.

DEAR JUDGE CHENOWETH: After the following resolution was read in the weekly luncheon meeting of this chamber, it was followed by formal action in a meeting of the board of directors. The resolution is submitted to yourself and Senators Millikin and Johnson. There is no question as to the attitude of this organization and this county.

RESOLUTION

Whereas the waters of two rivers, Chucaras and Huerfano run through Huerfano County and flow into the Arkansas River; and

Whereas this chamber, through its diligent water committee is alert to all causes of water conservation in the upper Colorado Basin, the water conservation board, and the Water Development Association of Southeastern Colorado (the Fryingpan-Arkansas project;) and

Whereas Huerfano County has three members of the board of the above Water Development Association board in regular attendance upon the deliberations of said association; and

Whereas the Fryingpan-Arkansas project has been approved through all stages and is now subject to hearings by the congressional committees: Now, therefore, be it

*Resolved by the Board of the Huerfano County Chamber of Commerce*, That full backing of the project in its pendency in the Congress for final authorization is most heartily endorsed by this Chamber.

HUERFANO COUNTY CHAMBER OF COMMERCE,
RALPH H. FAXON, *Secretary.*

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RESOLUTION

*Be it resolved*, That the Florence Chamber of Commerce of Florence, Colo., unanimously endorses and supports the Fryingpan-Arkansas water project, and conscientiously urges the completion of such project.

Since one of the functions of this organization is to promote industrial expansion as well as to build a greater and better community, we consider that it is necessary that a supplemental water supply be obtained for domestic, irrigation, and industrial expansion, and firmly believe that the completion of the Fryingpan-Arkansas water project will be decidedly beneficial to this city and the surrounding area.

FLORENCE CHAMBER OF COMMERCE,
PARR MERRIMAN, *Secretary-Manager.*

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FOWLER CHAMBER OF COMMERCE,
*Fowler, Colo., May 21, 1953.*

Mr. MARC G. WILLIAMSON,
*Pueblo, Colo.*

DEAR SIR: The board of directors of the Fowler Chamber of Commerce urgently request your support in the Congress of the United States to give favorable consideration to the authorization of the Frying Pan-Arkansas project.

It is needless to discuss the merits of this project as they have been thoroughly examined before but without the completion of this project our economy in this territory will remain at a standstill.

In this semiarid region where rainfall is usually deficient a diversion project is a must if the general economic condition of this valley remain and continue to increase and prosper.

The Fowler Chamber of Commerce and the entire Fowler community will greatly appreciate your support in this undertaking.

Sincerely yours,

Paul Stauder, President, Chamber of Commerce; Wm. W. Watkins, Lee Mathes, Harold Eddy, R. D. Lewis, J. L. Damgaard, J. L. Weigand, Keith Applegate, J. W. Fox, Board of Directors.

ROCKY FORD JUNIOR CHAMBER OF COMMERCE,
*Rocky Ford, Colo., May 26, 1953.*

RESOLUTION

Whereas the proposed Fryingpan-Arkansas Diversion project is vital to the growth and development of our community, the Arkansas Valley and our State as a whole,

Whereas the multiple-purpose project is designed to firm up irrigation water supplies for 332,000 acres of Arkansas Valley land, provide a domestic water supply for Pueblo, Colorado Springs, Eads, La Junta, Lamar, Las Animas, Rocky Ford, Salida and other valley towns, supply vast quantities of hydropower, provide complete flood control, some silting and sedimentation protection, improve fish, wildlife, and general recreation facilities and generally stabilize the economic life of the valley and the eastern slope.

Whereas the project hearings in Washington are tentatively set for early June before the House and possibly Senate: Now therefore be it

*Resolved*, That the Rocky Ford Junior Chamber of Commerce fully supports and is in complete accord with the aims and purposes of the Fryingpan-Arkansas water diversion project.

Adopted at a meeting of the general membership on May 26, 1953.

ROCKY FORD JUNIOR CHAMBER OF COMMERCE,
HUGH E. PICKREL, *President.*

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RESOLUTION

Whereas the proposed Fryingpan-Arkansas diversion project is vital to the growth and development of our community, the Arkansas Valley and our State as a whole;

Whereas the multiple-purpose project is designed to firm up irrigation water supplies for 332,000 acres of Arkansas Valley land, provide a domestic water supply for Pueblo, Colorado Springs, Eads, La Junta, Lamar, Las Animas, Rocky Ford, Salida, and other valley towns, supply vast quantities of hydropower, provide complete flood control, some silting and sedimentation protection, improve fish, wildlife, and general recreation facilities and generally stabilize the economic life of the valley and the eastern slope;

Whereas the project hearings in Washington are tentatively set for early June before the House and possibly Senate: Now, therefore, be it

*Resolved*, That the Pueblo Junior Chamber of Commerce fully supports and is in complete accord with the aims and purposes of the Fryingpan-Arkansas water division project.

Adopted at a meeting of the Board of Directors on May 18, 1953.

CHARLES E. BERRY, *President.*
KENNETH KING, *Secretary.*

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RESOLUTION

Whereas the Fort Lyon Canal Co. is a mutual ditch company organized and existing by virtue of the laws of the State of Colorado, with its principal place of business at Las Animas, Colo.; and

Whereas the Fort Lyon Canal Co. has the largest irrigation system used for the purpose of diverting water from the Arkansas River and distributing the same to its stockholders who are the owners of land adjoining the Arkansas River to which the water diverted is beneficially applied, there being approximately 94,000 acres of land irrigated with water diverted and distributed by the said canal company; and

Whereas the Fort Lyon Canal Co. has kept fairly accurate records of the water diverted by it and its predecessor in interest ever since the year 1884, and has also kept an accurate record of the rainfall in the area served by the Fort Lyon Canal Co. and has conducted an intensive and constant study of the effect of irrigation in the area as well as the need of the land for irrigation and the deficiency in water supplies; and

Whereas the officers and employees of the Fort Lyon Canal Co. have studied the reports and proposals of the Bureau of Reclamation with reference to trans-mountain diversion of water from the western slope of Colorado to the Arkansas

Valley and particularly the project known as the Fryingpan-Arkansas project and are well acquainted with the details thereof: Now, therefore, be it

*Resolved by the board of directors of the Fort Lyon Canal Co., as follows,*

1. That it unqualifiedly endorses the proposals and reports of the Bureau of Reclamation and recommends to the Congress of the United States that it enact such laws as may be necessary to authorize the construction of the Fryingpan-Arkansas project and to appropriate such sums as may be needed to complete the construction thereof;

2. That it believes that the said project is vitally needed for the benefit of the Arkansas Valley and is economically justified.

3. That certified copies of this resolution be sent by the secretary of the Fort Lyon Canal Co. to the Members of Congress from Colorado for such use as they desire to make of the same and to show to them the unanimous support given by the Fort Lyon Canal Co. to the legislation now pending before the Congress.

I, Emma Billings, secretary of the Fort Lyon Canal Co., do hereby certify that the above resolution is a portion of the minutes of the May 6, 1953, meeting of the board of directors of the Fort Lyon Canal Co.

EMMA BILLINGS, *Secretary.*

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RESOLUTION IN REFERENCE TO FRYINGPAN-ARKANSAS RIVER DIVERSION PROJECT

Whereas there will shortly be considered by the Congress of the United States, the matter of providing necessary funds to carry out the important Fryingpan-Arkansas Water diversion project, and

Whereas the Pikes Peak region is vitally interested in any plan for increasing the water resources of the region in order to provide necessary water for its rapidly growing population, and

Whereas, it is the opinion of many of the residents of the Pikes Peak region that the proposed development of the Fryingpan-Arkansas transmountain water diversion project would help to provide such increase, now, therefore;

The Fountain Mutual Irrigation Co. whose address is Colorado Springs, Colo., does approve of the contemplated diversion and we further urge the Congress to approve and to authorize the necessary funds to further the project.

The above resolution was passed at a regular meeting of the directors of the Fountain Mutual Irrigation Co. on May 12, 1953.

THE FOUNTAIN MUTUAL IRRIGATION CO.,
C. A. FOSTER, *President,*
R. E. JOHNSON, *Secretary.*

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STATEMENT SUBMITTED BY THE FARMERS' LUNCHEON CLUB OF COLORADO SPRINGS, COLO., SUPPORTING THE PROPOSED FRYINGPAN-ARKANSAS WATER DEVELOPMENT PROJECT

For purposes of identification the Farmers' Luncheon Club of Colorado Springs is a group of 25 to 30 farmers, ranchers, and businessmen who are interested in the agricultural development of El Paso County and surrounding areas.

For many years this group has met on the first and third Saturdays of each month except during the summer, to discuss such subjects, and has a hand in the development of the agricultural development in the area.

The rapid growth of Colorado Springs has increased the demand for domestic water, many fold; thus the water rights acquired by the city sometime ago have been transferred to their headwaters reservoir on the slope of Pikes Peak. Also much of the flow of Fountain Creek has been diverted for this purpose in the last year or two. This has resulted in the reduction of the number of acres of irrigated land used for agricultural purposes on the streams of the Fountain and Monument Creeks, from 20,967 in 1929 as compared with 13,820 acres in 1952.

For the past 4 years, farms on the Fountain River and Monument Creek have been short of water; and reservoirs, depending on storage from the Fountain River, have been only partially filled.

While water diverted under the Fryingpan-Arkansas project cannot be directly applied to the lands of the Fountain Valley in El Paso County, it is felt there will be an indirect benefit, in that water may be obtained by an agreement of exchange, or that the call for water in the upper reaches of the Fountain and Monument Creeks may not be so heavy, thus relieving the situation for the farmers in the area.

It is also felt that the increased power supply will cause an increase in industry in the area, which will mean an increased demand for agricultural products.

More water for the area will mean an expansion of the already large military installations now in existence.

Now therefore; we, the Farmers' Luncheon Club of El Paso County feel that this project will be of great benefit to the people of southern Colorado and ask that the committee give it full and favorable consideration.

Dated this 21st day of May 1953.

FARMERS' LUNCHEON CLUB,
H. L. BONEHER, *President.*
RALPH SEIRICH, *Secretary.*

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RESOLUTION

Whereas the Southeastern Colorado Soil Conservation Association represents 26 districts in the Arkansas River drainage area from the headwaters of the Arkansas to the Kansas State line; and

Whereas there are 2,370 farmers having cooperating agreements both basic and initial types embracing 381,582 acres of irrigated land; and

Whereas the Arkansas Valley in Colorado has been seriou ly short of irrigation and domestic water, and is facing more serious shortage; and

Whereas the proposed Fryingpan-Arkansas project will supplement this vital need for water and conservation; be it herewith

*Resolved*, That this association go on record approving the Fryingpan-Arkansas project and urge immediate authorization by the Congress of the United States.

Further that copies of this resolution be sent to our congressional delegation in Washington.

FRANK B. GRAHAM, *President.*

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RESOLUTION

Whereas we realize that conservation of our natural resources is of the utmost importance, especially at this time, when all out production of food and fiber is vital to our country's welfare and survival and,

Whereas water, properly controlled and utilized, is the prime element in conservation; in the production of power; in the prevention of damage to the productive land in this area during flood conditions; in stabilization of our present economy, in addition to the development of other and varied resources and industries that would add materially to national defense and wealth through utilization of metallic and nonmetallic values within the area; improvement and enlargement of the recreational advantages within the area,

We, the supervisors and cooperators of Upper Arkansas Soil Conservation District, in annual meeting assembled this 6th day of February 1952, at Salida, Colo., with 250 farmers and ranchers of the area in attendance and voting,

Do urge that you exert every effort to secure early introduction and favorable consideration for authorization of the Fryingpan-Arkansas project.

Motion by Will Hallock, seconded by Hugh Clark, and unanimously carried.

WALTER T. SNEDDON, *Secretary.*

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RESOLUTION—ROTARY CLUB OF PUEBLO

Whereas the welfare, prosperity and population growth of the Arkansas Valley in Colorado is based upon and limited by an adequate and dependable supply of water for irrigation, municipal, manufacturing, and industrial uses;

And whereas the entire streamflow of the Arkansas River and its tributaries in said valley has been appropriated and is now being utilized for the aforesaid beneficial purposes;

And whereas there is no additional water supply available for such uses in said valley except by the importation of water from the Colorado River Basin, by and through the construction and operation of a transmountain diversion project: Now, therefore,

*Be it resolved by the Pueblo Rotary Club No. 43, acting by and through its board of Directors*, That the project proposed, designed, and recommended by the Bureau of Reclamation and known as the Fryingpan-Arkansas transmountain diversion project, be and it is heartily endorsed; and that its approval and authorization by

the Congress of the United States be, and hereby is, requested, recommended, and earnestly urged.

Adopted by the board of directors of the Pueblo Rotary Club, May 19, 1953.

ROY O. FRANTZ, *Secretary.*
CHARLES W. ST. JOHN, *President.*

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RESOLUTION—ROCKY FORD ROTARY CLUB

Whereas the members of the Rocky Ford Rotary Club as business and professional men and farmers in this community are acutely interested in the obtaining of additional water for irrigation in this community and the Arkansas Valley as a whole; and

Whereas it appears that the Fryingpan-Arkansas River project now being contemplated would supply additional water for the Arkansas Valley: Therefore be it

*Resolved by the Rocky Ford Rotary Club of Rocky Ford, Colo.*, That this organization is unanimously in favor of the Fryingpan-Arkansas River diversion project.

A. W. TEMPLETON, *President.*

Attest:

F. M. MCCOWN, *Secretary.*

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RESOLUTION—ROTARY CLUB OF CANON CITY

Whereas Colorado is richly endowed with natural resources as fertile land and an abundance of mineral wealth beneath the soil; and

Whereas the population of Colorado is increasing at a phenomenal rate; and

Whereas the continued development of the aforementioned resources and welfare of the mass population are dependent upon the key resource, water; and

Whereas there is now before the Congress of the United States a bill to construct the Fryingpan-Arkansas project, which said project will develop, conserve, and make available for consumptive use an amount of water now absolutely necessary and positively needed in the valley of the Arkansas River: Now, therefore, be it

*Resolved*, That the Rotary Club of Canon City does hereby respectfully urge the Colorado congressional delegation to take all action proper and necessary to secure congressional authorization of the Fryingpan-Arkansas project.

W. T. BERRY,
*President, Rotary Club of Canon City.*

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RESOLUTION—ROTARY CLUB OF LA JUNTA

Whereas we in the Arkansas Valley of Colorado have spent many years of work to increase our community water supplies and our water for agricultural production, and,

Whereas we are continually facing a serious shortage of domestic and irrigation water; and

Whereas the proposed Fryingpan transmountain water diversion project will increase the supply for domestic and irrigation water: Now, therefore,

The Rotary Club of La Junta does heartily support and urge the quickest possible action in the construction of the Fryingpan-Arkansas project.

ROTARY CLUB OF LA JUNTA, COLO.
K. I. CANFIELD, *President,*
DEAN R. KENDALL, *Secretary.*

MAY 19, 1953.

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ROTARY CLUB OF WALSENBURG,
*May 20, 1953.*

Mr. D. P. DUCY,
*President, The Water Development Association of Southeastern Colorado, Pueblo, Colo.*

DEAR SIR: The Rotary Club of Walsenburg, Colo., appreciating fully the necessity for economy in public expenditures, is nevertheless convinced that prompt use of all water, of the Colorado River allocated to the State of Colorado, is vital to the overall welfare of the Nation.

In this connection this club has maintained close contact with the progress of the Water Development Association of Southeastern Colorado, which is the sponsor for the plan to divert water from the Fryingpan River, a tributary of the Colorado River, through the Continental Divide to the Arkansas River, for the primary purpose of supplying domestic water to a large proportion of the people living along and adjacent to the Arkansas River in Colorado, and as a secondary purpose the supplying of water to make up deficiencies in irrigation water that now exist on lands already under cultivation, and as a third purpose and least of importance, the development of power as a byproduct since this is merely the sensible means of conserving a potential asset.

This club believes the Congress should appropriate funds for the initiation of the project as the present session, and to that end, this letter is sent to you in order that you may know its wishes in this connection.

Very truly yours,

PAUL RICOTTONE, *President.*

Attest:

CARL S. SPORLEDER, *Secretary.*

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RESOLUTION—ROTARY CLUB OF SALIDA

Whereas we recognize conservation of our natural resources is of vital importance; and

Whereas the economic stability of this area depends largely upon the conservation and utilization of natural resources:

We, the members of the Salida Rotary Club, in weekly session May 18, with 32 members in attendance and voting, do hereby urge immediate authorization and construction of the Fryingpan-Arkansas project.

KENNETH E. BARNHILL,
*President, Salida Rotary Club.*

Motion by Mr. Clyde Wilkinson, seconded by Mr. J. Ford White, and unanimously carried.

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RESOLUTION APPROVED AT ANNUAL MEETING OF MEMBERS OF THE SOUTHEAST COLORADO POWER ASSOCIATION AT LA JUNTA, COLO., ON FEBRUARY 9, 1952

Whereas we, the members of the Southeast Colorado Power Association, are vitally interested in the Fryingpan-Arkansas project of the Bureau of Reclamation; and

Whereas the Fryingpan-Arkansas project will give much-needed irrigation water to people living on the east side of the Continental Divide without harming the irrigating possibilities of people living on the west side of the Continental Divide and will further give flood control to both east and west sides of the Continental Divide; and

Whereas the Fryingpan-Arkansas project will furnish electric energy so that the Southeast Colorado Power Association can complete the furnishing of central station electric power to all rural communities and farms in southeast part of Colorado: Therefore be it

*Resolved*, That we, the members of the Southeast Colorado Power Association, representing 5,000 members of the association, do respectfully request that our United States Senators and Representatives and State senators and representatives support the Fryingpan-Arkansas project to their fullest extent, and make every effort for the Fryingpan-Arkansas project to become a reality; and be it further

*Resolved*, That the members of the Southeast Colorado Power Association respectfully request that every effort be made by our Senators and Congressmen to retain the preference clause in the Federal laws so that such electric cooperatives as the Southeast Colorado Power Association will be able to purchase such federally generated power. The members of the Southeast Colorado Power Association feel that the removal of such preference right would jeopardize their chances of receiving federally generated power. They also believe that the preference clause is not causing undue hardship on any privately owned electric utility since only 3.4 percent of such federally generated power is now sold to rural electric cooperatives; and be it further

*Resolved*, That members of the Southeast Colorado Power Association express their appreciation to the United States Senators and Congressmen and to the

State senators and representatives for their past efforts in behalf of the Rural Electrification Administration program; and be it further

*Resolved*, That a copy of this resolution be sent to all United States and State Senators and Representatives.

LEWIS E. AMEND, *President*,
NEILL B. MCGRATH, *Secretary*.

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SAN LUIS VALLEY RURAL ELECTRIC COOPERATIVE, INC.,
*Monte Vista, Colo., April 29, 1952.*

Mr. D. P. DUCY,
*Box No. 815, Pueblo, Colo.*

DEAR SIR: This is to advise that we are anxious to do everything within our power to foster the success of the Fryingpan-Arkansas project. Please feel free to call upon us at any time you feel that we can be of any assistance.

Following is a portion of the minutes adopted by the board of directors at their last regular board meeting:

"Whereas the proponents of the Fryingpan-Arkansas project are now seeking authorization of this project by the Congress of the United States; and

"Whereas the construction of this project would be beneficial to the San Luis Valley Rural Electric Cooperative, Inc., in that the power developments planned therein would alleviate the shortage of power in the San Luis Valley and would reduce or eliminate the excessive wheeling charges now being paid by this cooperative; and

"Whereas it would be to the best interest of this cooperative to encourage the approval of the Fryingpan-Arkansas project: Now, therefore, be it

"*Resolved*, That all possible assistance be given to the proponents of the Fryingpan-Arkansas project, including any appearances before congressional committees that may be deemed advisable, and the furnishing of any information requested in support of the passage of the bill authorizing the construction of this project; and be it further

"*Resolved*, That a copy of this resolution be forwarded to the proponents of the Fryingpan-Arkansas project as evidence of the support of the members of this cooperative."

Very truly yours,

RAY W. VILLYARD,
*Manager*.

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RESOLUTION OF THE SALIDA LIONS CLUB ADOPTED THIS 18TH DAY OF MAY 1953

*To the Honorable Members of the House of Representatives and the Senate of the Congress of the United States of America:*

Whereas the members of the Salida Lions Club do by this resolution heartily endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas, by making available more water for irrigation in these States, and more power to operate industries, businesses, and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to the sections where adequate water and power are available, and the resultant water and power from this project will be sufficient to accommodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business; all of which can be derived from the increased water and power from this project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas project is too great to be defrayed by State or private interests: Now therefore be it

*Resolved by the Salida Lions Club*, That the accomplishment of this diversion project is in the best interest of our Nation, and the Salida Lions Club does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

EARL G. GANLEIN, JR., *President*.

Attest:

H. E. MCDANIEL, *Secretary*.

RESOLUTION OF THE BUENA VISTA LIONS CLUB ADOPTED THIS 20TH DAY OF MAY 1953

*To Honorable Members of the House of Representatives and the Senate of the Congress of the United States of America:*

Whereas the members of the Buena Vista Lions Club do by this resolution endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas by making available more water and power to operate industries, businesses, and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to sections where an adequate supply of water and power is available, and the resultant water and power from this project will be sufficient to accomodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business, all of which can be derived from the increased water and power from the project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas River project is too great to be defrayed by State or private interests: Now, therefore, be it

*Resolved by the Buena Vista Lions Club,* That the accomplishment of this diversion project is in the best interest of our Nation and the Buena Vista Lions Club does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

CRAIG GREENWALD, *President.*

Attest:

EARL MOSLEY, *Secretary.*

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LIONS CLUB OF CANON CITY,
*Canon City, Colo., May 19, 1953.*

RESOLUTION

Whereas Colorado is richly endowed with natural resources, as fertile land and an abundance of mineral wealth beneath the soil; and

Whereas the population of Colorado is increasing at a phenomenal rate; and

Whereas the continued development of the aforementioned resources, and welfare of the mass population are dependent upon the key resource—water; and

Whereas there is now before the Congress of the United States a bill to construct the Fryingpan-Arkansas project, which said project will develop, conserve, and make available for consumptive use an amount of water now absolutely necessary and positively needed in the Valley of the Arkansas: Now therefore, be it

*Resolved,* That the Canon City Lions Club does hereby respectfully urge the Colorado congressional delegation to take all action proper and necessary to secure congressional authorization of the Fryingpan-Arkansas project.

CHESTER L. SHORT, *President.*

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RESOLUTION

Whereas the communities and citizens of the Arkansas Valley in Colorado have spent many years of effort to increase their water supply, both for domestic use and irrigation; and

Whereas the proposed Fryingpan-Arkansas transmountain water diversion project will increase the vital supply of water to our people and lands; and

Whereas, the badly needed water will allow increased production of high-grade agriculture products, and will allow expansion of the processing of natural resources, and increase industralization through increased water supplies and electric power generation; and

Whereas all of these factors are vital to the national-defense program and the internal strengthening of our country; now, therefore

The La Junta Lions Club does favor and urge the immediate construction of the Fryingpan-Arkansas transmountain water diversion project.

The La Junta Lions Club,
R. B. Bolles, *President.*

Attest:

C. E. Surber, *Secretary.*

May 18, 1953.

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Resolution, Lions Club, Ordway, Colo.

Whereas the Bureau of Reclamation is planning the development of new sources of water for the eastern slope of Colorado, known as the Fryingpan-Arkansas transmountain diversion project; and

Whereas, said project would result in many benefits for the town of Ordway and for Crowley County, Colo., as well as for the entire Arkansas Valley; and

Whereas said project would be particularly beneficial to the entire farming area of southeastern Colorado in providing supplemental water for the irrigation thereof; now, therefore, be it

*Resolved, and it is hereby resolved, by the Ordway Lions Club of Ordway, Colo.,* That said organization manifest its approval of said project and express its great interest in the early passage of the necessary legislation and the appropriation of the funds required for the completion of said project; and be it further

*Resolved,* That copies of this resolution be furnished to the Bureau of Reclamation, the Water Development Association of Southeastern Colorado, and the Colorado Senators and Representatives in the Congress of the United States.

Introduced and adopted at the regular meeting of the Ordway Lions Club held at Ordway, Colo., on May 19, 1953.

Worth W. Hyde, *President.*

Attest:

Arnold Wilshusen, *Secretary.*

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Resolution

Whereas the members of the Rocky Ford Lions Club as business and professional men and farmers in this community are acutely interested in the obtaining of additional water for irrigation in this community and the Arkansas Valley as a whole; and

Whereas it appears that the Fryingpan-Arkansas River project now being contemplated would supply additional water for the Arkansas Valley: Therefore be it

*Resolved by the Rocky Ford Lions Club of Rocky Ford, Colo.,* That this organization is unanimously in favor of the Fryingpan-Arkansas River diversion project.

Wayne B. Pott, *President.*

Attest:

Philip Hee, *Secretary.*

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Resolution, Lions Club, Fowler, Colo., in Support of Fryingpan-Arkansas Project

Whereas the supply of water for irrigated farmland in the Fowler community is deficient; and

Whereas some farmland in this community is in danger of being abandoned because of a shortage of irrigation water; and

Whereas many families have established themselves in our community, believing that in the near future additional water will be available; and

Whereas in recent years some of the newly acquired families, and some old settlers have become discouraged, due to water shortage and have left our valley, and others contemplate leaving, because of the acute shortage of irrigation water; and

Whereas the normal flow of river water is dependent on a large snowfall in the mountains, which in many years is insufficient; and

Whereas during the past 10 years, farmers in this community have organized the West Otero Soil Conservation District, and in cooperation with the district have spent more than $1,200,000 to improve their land for a more economic use of irrigation water, and have established many soil saving and soil building practices; and

Whereas the economic welfare of this community is entirely dependent on a profitable agriculture, insured by a suitable supply of irrigation water for our farms: Therefore be it

*Resolved*, That the Lions Club of Fowler, Colo., respectfully request the Congress of the United States, and agencies thereof to give favorable consideration to the authorization of the Fryingpan-Arkansas project.

Very sincerely,

EARL W. DIVEN, *President.*
JOSEPH M. RILEY, *Secretary.*

Signatures of members of Fowler Lions Club to attached resolution:
John B. Fulbright, 201 East Park Avenue, associate professor of education
W. H. Baker, 601 Eighth Street, barber
D. L. Wieson, 306 Sixth Street, barber
D. W. Bascom, 612 Main, bookkeeper
J. R. Casey, 314 Florence, station lessee
Homer Fowler, 612 Eighth Street, superintendent of schools
Ernie O. Enderad, Box No. 428, farming
Louise Buchner, Box No. 405, dairy
Smith E. Diven, 504 Eighth Street, president, Diven Packing Co.
Phil D. Elson, 306 East Grant, manager telephone office
Perle R. Allison, R. F. D. No. 1, Box No. 14, farming
Douglas V. Blodgett, Box No. 242, combination man
Joe M. Fox, 308 Fifth Street, vice president and cashier, Fowler State Bank
Carl Thomas Bauer, 117½ Main Street, president, First National Bank, Fowler
R. H. Thomas, 606 Main Street, electrician
Wm. M. Reglin, 221 Main Street, men's clothing store
Hy H. Rothganger, 203 East Cranston, farm machinery and automobiles
K. C. McKinney, Route No. 1, Fowler, Colo., Fowler farmer and rancher
D. D. Kindell, 208 Park Avenue, Fowler, Colo., farm implement sales and service
J. Paul Morgan, 308 Main Street, Fowler, Methodist minister
Donald A. Buck, Post Office Box A, editor, Fowler Tribune
A. A. Keeling, 219 Main, Keeling Hardware
Joe Wills, Post Office Box B, motion picture theater
Murrell Scherrer, Post Office Box 305, grocery
Lee Landis, Post Office Box No. 294, cleaner
Ronald Langdon, 302 Sixth, hardware
Clifford Waddle, 711 South Main Street, hardware
John D. Ingram, Route No. 2, Box No. 48, rancher
Floyd Kreider, 202 East Grant, rancher
Guy E. Phelps, 324 Main Street, contractor
J. M. Riley, 206 East Grant Avenue, clerk
Earl W. Diven, Box No. 128, canner, Diven Packing Co.
J. L. Weigand, 307 East Park Avenue, banking
Bruce E. Ham, 205 Fifth Street, Fowler, service department
James F. Moffitt, Box No. 185, Fowler, Colo., insurance and bookkeeping service
Curtis L. Miller, 212 Ninth, Fowler, Colo., druggist
Clifford A. Rowe, 612 Main Street, produce dealer
Charles Heckart, 210 Main Street, mayor
C. R. Landers, 702 Eighth Street, railway station agent
Carl Howe, 412 Florence Avenue, Citizens Utilities Co.
Ora Switser, Box No. 233, alfalfa milling

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RESOLUTION

Whereas the Lions Club of the city of Leadville, Colo., recognizes the extreme need for additional water supply for the further development and industrial growth of the Pueblo, Colorado area; and

Whereas the Lions Club also recognizes the need for additional municipal water as well as irrigation water in the Arkansas Valley of Colorado; and

Whereas the Lions Club further realizes a very definite need for economical electric power to bring further development to the mining and smelting industry in the Leadville mining district: Be it

*Resolved*, That the Lions Club of the city of Leadville, Colo., does hereby respectfully urge the Congress of the United States to approve the Fryingpan-

Arkansas project at the earliest possible date, for the reasons as outlined in this resolution.

DON ROLL, *President.*
JOHN NYGRE, *Secretary.*

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RESOLUTION

Whereas Pueblo and the Arkansas Valley in Colorado has been seriously short of domestic and irrigation water for many years, and is facing more serious shortages as population increases; and

Whereas the proposed Fryingpan-Arkansas transmountain water diversion project will serve to supplement the vital need for increased domestic and irrigation water; and

Whereas this supplemental water will serve the needs of the present and expanding population, and will allow the production of high-grade agricultural products, as well as increased agricultural processing and industrialization; and

Now therefore, the Elks Lodge No. 90 of Pueblo, Colo., does favor and urge the immediate construction of the Fryingpan-Arkansas water diversion project.

BPO ELKS NO. 90, PUEBLO, COLO.,
WILLIAM W. NORTH, *Exalted Ruler.*

Attest:

HARPER GARDNER, *Secretary.*

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WALSENBURG LODGE NO. 1086,
BENEVOLENT AND PROTECTIVE ORDER OF ELKS,
*Walsenburg, Colo., May 20, 1953.*

Mr. D. P. DUCY,
*President, the Water Deve'opment Association*
*of Southeastern Colorado, Pueblo, Colo.*

DEAR SIR: Lodge No. 1086 of the Benevolent and Protective Order of Elks of Walsenburg, Colo., in regular session on the 19th day of May 1953, takes the liberty of addressing you at this time in connection with the hearings, shortly to be conducted by the proper committees of the Congress of the United States of America, concerning appropriation of funds for the construction of the Fryingpan-Arkansas transmountain diversion of water, as sponsored by the Water Development Association of Southeastern Colorado.

It is the opinion of this lodge of Elks that, in the interest of the Nation, as a whole, the waters of the Colorado River should be utilized to the fullest extent on the upper reaches of that stream. Principal among the reasons for this opinion is the fact that here, near the center of our country, is the area least likely to attack from foreign enemies and therefore most suitable for greater industrial and agricultural development. But the accomplishment of these objectives is impossible without adequate water. The Colorado River is the last great source of water in the Rocky Mountain area, now but partially developed. Time is the essence of this problem. Too much delay will result in permanent loss to this area of this great asset, with attendant loss to the Nation at large.

It is therefore respectfully requested that you utilize your great influence in the Congress to bring about an early appropriation for the accomplishment of this most worthy enterprise.

Very truly yours,

HARRY BIGGI, *Exalted Ruler.*

Attest:

C. F. HINDES, *Secretary.*

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RESOLUTION

Whereas the Arkansas Valley in Colorado has been seriously short of domestic and irrigation water for many years, and is facing more serious shortages as population increases; and

Whereas the proposed Fryingpan-Arkansas transmountain water diversion project will serve to supplement the vital need for increased domestic and irrigation water; and

Whereas this supplemental water will serve the needs of the present and expanding population, and will allow the production of high-grade agricultural products, as well as increased agricultural processing and industrialization; and

Now therefore, the Elks Lodge, No. 701 of La Junta, Colo., does favor and urge the immediate construction of the Fryingpan-Arkansas water diversion project.

BPOE No. 701, La Junta, Colo.,
K. T. Trout.

Attest:

H. G. Brasim, *Secretary.*

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Pueblo Fish and Game Association,
*Pueblo, Colo., May 21, 1953.*

Water Development Association of Southeastern Colorado,
*129 West Ninth Street, Pueblo, Colo.*

Dear Sir: Whereas Pueblo Game and Fish Association, comprised of the sportmen of Pueblo and surrounding Arkansas Valley have taken notice of the continual shortage of water here in the Arkansas Valley and considering the effects of such a shortage on the fish and wildlife of this territory, and

Whereas the membership of the Pueblo Game and Fish Association after due and careful consideration of the merits of the Pan-Ark projects and the consideration given therein to fish and wildlife management unanimously instruct its officers to support the Pan-Ark project.

Therefore Pueblo Game and Fish Association endorse the Pan-Ark project in its entirety and urges immediate approval be given the Pan-Ark project and that construction be started as soon as possible.

Sincerely,

Pueblo Game and Fish Association,
John S. Sharp, *President.*

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Resolution of the League of Business and Professional Women, Pueblo, Colo.

Whereas it is generally recognized that adequate water supply is essential for the welfare of any community; and

Whereas growth and expansion of the Arkansas Valley is outstripping present available water supplies, and the economic future of the area hinges on obtaining of additional sources of water; and

Whereas the Fryingpan-Arkansas diversion project has been devised by authorities well versed in such matters, and includes compensatory features for the western slope of the State, in which region the project will have its source; and

Whereas the project will make available domestic water, supplementary irrigation, power supplies, and flood control for an area vital to national defense, and at the same time provide protection for wildlife and fish, and recreation facilities: Be it herewith

*Resolved*, That the League of Business and Professional Women of Pueblo, Colo., does fully endorse the Fryingpan-Arkansas diversion project, and urges the Colorado congressional delegation to exert every effort possible to bring about congressional approval of the project, along with necessary appropriations with which to institute work thereon as soon as possible.

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The Salida Flying and Civic Club,
*Salida, Colo., May 20, 1953.*

*To the Honorable Members of the House of Representatives, and the Senate of the Congress of the United States of America—and to Whom It May Concern:*

The Salida Flying and Civic Club, a civic club of Salida with a membership of 168 members, were the original sponsors of the fund drive in 1946 for the Gunnison-Arkansas water diversion project—later called the Fryingpan-Arkansas water diversion project. We have since that time contributed generously of our time and funds to the Water Development Association of southeastern Colorado, the sponsors of this project, with the firm belief that there is an immediate, and urgent need throughout the Arkansas Valley, for more and cheaper electrical energy, a supplement for more water, a definite need for flood control, and preservation of our fish and game.

We feel that the Fryingpan-Arkansas project will fulfill these urgent needs, and as a body, our club recommends that the Congress of the United States of America take favorable action to authorize this project as soon as possible.

Respectfully yours,

PORTER H. WHITCOMB, *Secretary.*

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RESOLUTION—HUERFANO POST NO. 16, WALSENBERG, COLO.

Whereas Huerfano Post, No. 16 of the American Legion, whose headquarters are at Walsenburg, Colo., is primarily concerned with the safety and defense of the United States of America; and

Whereas it is the opinion of this post that the development of agriculture and industry to the fullest extent possible in the interior and particularly in the Rocky Mountain region of the United States will contribute immeasurably to the safety and welfare of the people of the United States; and

Whereas the Water Development Association of Southeastern Colorado is the sponsor for the transmountain diversion of water from the Fryingpan River, a tributary of the Colorado River, through a tunnel into the Arkansas River; and

Whereas the accomplishment of this project will supply sorely needed water for the expansion of industrial activities and agriculture in this area; and

Whereas the proposal for such transmountain diversion has been approved by the Department of the Interior and the Bureau of the Budget, for immediate construction and has been submitted to the proper committees of Congress for hearings and their subsequent recommendations: Now, therefore, be it

*Resolved,* That Huerfano Post No. 16 of the American Legion hereby endorses the appropriation of funds necessary to construction of the Fryingpan-Arkansas project by the Congress of the United States and that copies of this resolution be sent to all members of the Colorado delegation and the original to the Water Development Association of Southeastern Colorado.

JOHN P. RICHMAN, *Post Commander.*

Attest:

GEORGE DUSSART, *Adjutant.*

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RESOLUTION OF THE PONCHA SPRINGS BOOSTER CLUB ADOPTED THIS 19TH DAY OF MAY 1953

*To the Honorable Members of the House of Representatives, and the Senate of the Congress of the United States of America:*

Whereas the members of the Poncha Springs Booster Club do by this resolution heartily endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas, by making available more water for irrigation in these States, and more power to operate industries, businesses, and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to the sections where adequate water and power is available, and the resultant water and power from this project will be sufficient to accommodate such industries; and

Whereas the overall cost of construction of the Fryingpan-Arkansas project is too great to be defrayed by State or private interests; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business; all of which can be derived from the increased business by water and power from this project: Now, therefore, be it

*Resolved by the Poncha Springs Booster Club,* That the accomplishment of this diversion project is in the best interest of our Nation, and the Poncha Springs Booster Club does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

BERT DAVIS, *President.*
LOREEN F. COOTS, *Secretary.*

RESOLUTION

Whereas the proposed multipurpose Fryingpan-Arkansas project would put to beneficial use some surplus waters now going into the Pacific Ocean; and

Whereas the Arkansas Valley is in serious need of supplemental irrigation water for proven farmlands and in urgent need of domestic water for fast growing urban populations; and

Whereas the food, fiber, and electrical energy to be produced from the waters delivered by their project will strengthen the national defense: Now, therefore, be it

*Resolved by the Pueblo Board of Realtors in regular weekly meeting on March 7, 1952*, That we favor and urge the favorable and immediate action of the Congress of the United States upon the proposals for this project and further that copies of this resolution be sent to all Members of the Congress from Colorado and to the Southeastern Colorado Water Development Association.

FRED L. HOLLORAN,
*Secretary, Pueblo Board of Realtors.*

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PUEBLO AREA CREDIT UNION CHAPTER,
*Pueblo, Colo., July 8, 1950.*

Mr. D. P. DUCY,
*Pueblo, Colo.*

DEAR MR. DUCY: At the last regular meeting of this chapter held June 26, 1950, we invited Mr. Ben F. Powell, area engineer of the Bureau of Reclamation, to address us on the topic "The Gunnison-Arkansas Valley Water Diversion Project."

The membership was so impressed by his facts concerning the possibilities of relieving the water shortage of this area by the completion of this project that the following resolution was unanimously approved by regular motion:

RESOLUTION

Whereas the economy of the Arkansas Valley is directly traceable to an adequate water supply, which we do not now have; and

Whereas we have a direct and vital interest in the stabilization of the economy of this area: Therefore be it

*Resolved*, That the Pueblo Area Credit Union Chapter go on record as favoring the earliest completion of the project possible, and that our Senators, Congressmen, and Bureau of Reclamation officials be notified of our action.

Respectfully,

WILLIAM E. KELLETT, *President.*
HAROLD D. HARRIS, *Secretary.*

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PUEBLO UNITED LABOR LEAGUE,
*Pueblo, Colo., January 21, 1952.*

Mr. D. P. DUCY,
*President, Water Development Association of Southeast Colorado,*
*Pueblo, Colo.*

DEAR MR. DUCY: Speaking collectively for many of the local unions affiliated with the American Federation of Labor, the Congress of Industrial Organizations, and the Railroad Brotherhoods, we wish to assure you as president of the water development association the full support of organized labor in your undertaking.

The Fryingpan-Arkansas diversion project would be of tremendous benefit to all the citizens of this area. It is the perfect solution to our gravest problem, that of an inadequate water supply; the bottleneck that is retarding the civic, industrial, and agricultural expansion of this region.

Please feel free to call upon us whenever our membership can be of assistance toward the acquisition of this much-needed water resource.

Yours very truly,

R. F. HOBBS, *Chairman.*

BROTHERHOOD OF RAILROAD TRAINMEN,
LA JUNTA LODGE NO. 655,
*La Junta, Colo., May 19, 1953.*

*To Whom It May Concern:*

La Junta Lodge No. 655, Brotherhood of Railroad Trainmen, meeting this day in regular session at La Junta, Colo., discussed the proposed Fryingpan-Arkansas water diversion project as it relates to us as railroad employees and residents of the Arkansas Valley.

In the discussion, the following points were emphasized:

First: The soft water which this project would make available to residents of the Arkansas Valley for domestic use would benefit us greatly by providing an adequate supply of soft water to satisfy our needs. Heretofore we have had to use water which is hard and available only in limited amounts.

Second: The supplemental irrigation water made available by this project would greatly increase the production of agricultural products in the fertile Arkansas Valley, and as transportation workers, such increased production would mean more work for us.

By unanimous action the lodge endorsed this project as one of the most beneficial proposals ever to come to its attention.

Respectfully,

C. A. HINMAN,
*Acting Secretary.*

Approved:

D. M. AMERINE, *President.*

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RESOLUTION NO. 18—FIRST PHASE GUNNISON-ARKANSAS DIVERSION PROJECT

Whereas the several States coming under the watershed of the Colorado River have reached an accord on the diversion of the water of said river; and

Whereas this accord or agreement existing between the several States makes it possible to get great benefits for the State of Colorado and its Arkansas Valley through national legislation authorizing building the Gunnison-Arkansas water diversion project; and

Whereas this project as planned by the Reclamation service will bring additional water to the cities and towns of the Arkansas Valley and augment the irrigation water supply for the farms of the valley; and

Whereas the Gunnison-Arkansas project will provide additional electric power for domestic and industrial use and the completion of this project will add wealth to the State and aid in stabilizing economic conditions in the Arkansas Valley: Therefore be it

*Resolved*, That the delegates to the 56th annual convention of the Colorado State Federation of Labor here assembled endorse the first phase of the Gunnison-Arkansas diversion project and also endorse building a compensatory reservoir included in the first phase of this project to be located on the Roaring Fork River above Aspen, Colo.; and be it further

*Resolved*, That the delegates here assembled exert every effort to gain congressional authorization to build the first phase of the Gunnison-Arkansas diversion project, and that copies of this resolution be sent the Colorado delegation in the Congress, the Governor of Colorado, and the Reclamation service.

PUEBLO TRADES AND LABOR ASSEMBLY,
J. C. MCCAFFREY,
FRED W. BIERIG,
M. H. PEARSON,
A. TOFFOLI,
WALTER A. BEEBE,
C. L. GRAVES,
WM. J. MCELVAIN.

Motion to concur in above resolution carried.

RESOLUTION NO. 19—LABOR REPRESENTATION WITH WATER CONSERVATION BOARD

Whereas it is common knowledge that there exists a water shortage in parts of the State of Colorado, and that approximately 76 percent of the water of the State is passing out of the State at this time, and that the State of Colorado and its people are entitled by law to the use of 55 percent of the water originating in the State; and

Whereas there must be a series of dams built on the main streams of this State in order to insure the uses of this water, within the State, for irrigation, power, and domestic consumption: Therefore, be it

*Resolved*, That the Colorado State Federation of Labor appoint an official representative from that organization for the purpose of working with the Water Conservation Board of the State of Colorado on various problems pertaining to the above, said representative to be authorized to attend meetings of the board in various parts of the State as necessary in order to assist with the various problems instrumental in transmountain diversion, which is so necessary for the betterment of the State in general; and be it further

*Resolved*, That the time and expenses of the representative shall be paid by the Colorado State Federation of Labor.

Submitted by:

PUEBLO BUILDING TRADES COUNCIL.
G. R. ALLENBACH.
V. E. FLINT.
A. TOFFOLI.

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JANUARY 22, 1952.

Mr. D. P. DUCY,
*President, Water Development Association of Southeastern Colorado,*
*Pueblo, Colo.*

DEAR SIR: As president of the Water Development Association of Southeastern Colorado, you will undoubtedly welcome an opinion in regard to the Fryingpan-Arkansas diversion project from the rank-and-file members of our organization, the United Steelworkers of America, Congress of Industrial Organizations, who make up a large segment of the community and who will directly or indirectly be affected by the proposed project.

I can state that it has been the general policy of the CIO to consistently endorse all reclamation and conservation programs that have benefited the immediate community and the country as a whole.

This project, as the first phase in the development of the Gunnison-Arkansas diversion program, when completed, will assure an adequate supply of water that will enable industry to expand. This in turn would benefit labor and, consequently, the community as a whole. At the same time, it would guarantee more and better water to the consumers.

With these benefits in mind, we wholeheartedly endorse the Fryingpan-Arkansas diversion project; and, while you are in Washington, we would like to refer you to Mr. Frank M. Hoffman, 718 Jackson Place NW., Washington 6, D. C., who is the legislative representative for the CIO and who will, I am sure, give you all the assistance he can.

Sincerely yours,

GEORGE J. WHITE,
*President, Pueblo County U. S. A.—P. A. C.*

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JANUARY 22, 1952.

Mr. D. P. DUCY,
*President, Water Development Association of Southeastern Colorado,*
*Pueblo, Colo.*

DEAR SIR: We feel you should be advised that the Colorado State Industrial Union Council has endorsed the Fryingpan-Arkansas diversion program. This program, designed to supplement more municipal water supplies with more and better water, will, at the same time, develop electric power. This power can be utilized to attract industry to Colorado that would otherwise locate elsewhere.

The development of Colorado is an important factor to the welfare of its citizens and we feel that what benefits the citizens of Colorado would benefit the Nation as a whole.

Being aware of your intended trip to Washington, we would like to direct you to contact the assistant to the director of all State CIO councils, Mr. Anthony Smith, whose address is 718 Jackson Place NW., Washington 6, D. C. Mr. Smith, in cooperation with Mr. Frank M. Hoffman of the same address, will be glad to assist you in any way possible.

Yours very truly,

WAYNE PRICE,
*President, Colorado State Industrial Union Council.*

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PETITION

To Hon. EDWIN C. JOHNSON and Hon. EUGENE D. MILLIKIN,
*United States Senators for the State of Colorado.*

To Hon. J. EDGAR CHENOWETH,
*Congressman for the Third Congressional District.*

Your petitioners respectfully request that you introduce in the Congress of the United States as promptly as possible such legislation as may be required to authorize the construction of the Fryingpan-Arkansas project.

There has been a shortage of irrigation water in the Arkansas Valley for many years. In recent years the shortage of municipal water coupled with increased defense requirements imposed on the area all combine to create a critical shortage.

The Bureau of Reclamation has spent many years in investigating the project. The State officials of Colorado and the citizens of both the eastern and western slopes of Colorado spent 2 years reaching an agreement on the terms of the operation of the proposed project. Subsequently, the complete project report was officially released for comment by Federal agencies and affected States. No adverse comments of any affected States were received. On or about October 15, 1951, the Secretary of the Interior transmitted the project report, together with the comments of said States and agencies, to the Bureau of the Budget with the request that it receive favorable consideration. To this date the Bureau has not released any report thereon, nor do we have any assurance that such a report will issue during this session of Congress.

Because of the requirements of irrigated agriculture, municipal demands, and defense needs, we, the undersigned, familiar with the project and the requirements of our area, respectfully petition and request you on receipt hereof to introduce such legislation as you think proper to authorize the construction of the Fryingpan-Arkansas project. We ask that you do so promptly without waiting until the Bureau of the Budget has reported on this project.

Ira K. Young, Pueblo, Colo.
W. A. Wills, Pueblo, Colo.
Lewis A. Amend, Rocky Ford, Colo.
H. B. Mendenhall, Rocky Ford, Colo.
George T. Babcock, Rocky Ford, Colo.
G. S. Cosant, La Junta, Colo.
Frank S. Hoag, Jr., Pueblo, Colo.
Frank S. Hoag, Pueblo, Colo.
Arthur L. Allen, Pueblo, Colo.
Harold H. Christy, Pueblo, Colo.
Alva B. Adams, Pueblo, Colo.
Frederick T. Henry, Colorado Springs, Colo.
Ralph Suroh, Colorado Springs, Colo.
Smith E. Divens, Fowler, Colo.
Hugh Muir, Florence, Colo.
J. J. Fabrizio, Florence, Colo.
W. T. Berry, Canon City, Colo.
Don Hardy, Canon City, Colo.
L. Marion Chelf, Canon City, Colo.
Joseph R. Bullen, Pueblo, Colo.
R. Person, Pueblo, Colo.
W. T. Mathis, Pueblo, Colo.
D. P. Ducy, Pueblo, Colo.
D. B. Hyer, Jr., Pueblo, Colo.
T. C. Swanson, Pueblo, Colo.
W. R. Hoge, Pueblo, Colo.
J. A. Kenyon, Pueblo, Colo.
H. G. Emmons, Pueblo, Colo.
S. C. Scribner, Pueblo, Colo.
Marc G. Williamson, Pueblo, Colo.

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A RESOLUTION ENDORSING THE IMMEDIATE CONSTRUCTION OF THE FRYINGPAN-ARKANSAS TRANSMOUNTAIN WATER DIVERSION PROJECT

Whereas Pueblo and the Arkansas Valley in Colorado have been seriously short of domestic and irrigation water for many years, and are facing more serious shortages as population increases; and

Whereas Pueblo is the site of the largest steel mill west of the Mississippi and of the largest ordnance depot in this country, as well as many other substantial industries; and

Whereas the proposed Fryingpan-Arkansas transmountain water diversion project will serve to supplement the vital need for increased domestic and irrigation water; and

Whereas this supplemental water will serve the domestic needs of the present and expanding population, and will allow the production of high-grade agricultural products, as well as increased agricultural processing and industrialization: Now, therefore, be it

*Resolved by the council of Pueblo, a municipal corporation*, That the city of Pueblo, Colo., does hereby endorse and urge the immediate construction of the Fryingpan-Arkansas water diversion project.

Introduced May 26, 1953.

By CHAS. H. BOUSTEAD, *Councilman.*

Approved.

CARL D. BRYAN,
*President of the Council and Mayor of Pueblo, a Municipal Corporation.*

Attest:

———— ————, *City Clerk.*

Approved as to form.

JOHN H. MARSALIS, *City Attorney.*

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RESOLUTION RELATING TO THE FRYINGPAN-ARKANSAS RIVER DIVERSION PROJECT

Whereas there will be considered by the Congress of the United States the matter of providing necessary funds to carry out the important Fryingpan-Arkansas water-diversion project; and

Whereas said project would provide a substantial supplementation to the waters of the Arkansas River; and

Whereas an augmentation of water to the Arkansas River would have a very substantial and beneficial impact upon the economy and welfare of southeastern Colorado and its residents; and

Whereas supplementation of the waters of the Arkansas River and the water resources of the Arkansas Valley and southeastern Colorado in general are of urgent and immediate importance to the continued growth and welfare of all said areas; and

Whereas it is deemed that such supplementation of water will also be of great benefit to the Pikes Peak region: Now, therefore, be it

*Resolved by the city council of the city of Colorado Springs*, That it is respectfully and earnestly submitted that the Congress of the United States and other appropriate agencies of the Government approve the Fryingpan-Arkansas River project, grant funds for the construction thereof, and take such other steps as are necessary and proper to consummate such project.

Dated at Colorado Springs, Colo., this 26th day of May 1953.

C. HARRY BLUNT,
*Mayor and President of the Council.*

Attest:

R. F. SONNEKSON, *City Clerk.*

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RESOLUTION OF THE SALIDA CITY COUNCIL, ADOPTED THIS 18TH DAY OF MAY 1953

*To the Honorable Members of the House of Representatives and the Senate of the Congress of the United States of America:*

Whereas the City Council of the City of Salida does by this resolution heartily endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas, by making available more water for irrigation in these States, and more power to operate industries, businesses, and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to the sections where adequate water and power are available, and the resultant water and power from this project will be sufficient to accommodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business, all of which can be derived from the increased water and power from this project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas project is too great to be defrayed by State or private interests: Now, therefore, be it

*Resolved by the City Council of the City of Salida,* That the accomplishment of this diversion project is in the best interest of our Nation, and the City Council of the City of Salida does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

R. J. BRAZIL, *Mayor.*

Attest:

THEO. J. JUDGE, *City Clerk.*

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RESOLUTION—CITY OF WALSENBURG

Whereas the city of Walsenburg, Colo., is the county seat of Huerfano County and is situated on and derives its domestic water supply from the Cucharas River, which is a tributary of the Arkansas River; and

Whereas this city has maintained a keen interest in and close contact with the progress made by the Water Development Association of Southeastern Colorado in its organization and promotion of the Fryingpan-Arkansas project, which proposes the diversion of certain waters from the west slope, tributary to the Colorado River, through a tunnel cutting the Continental Divide, to the Arkansas River on the east slope; and

Whereas the city of Walsenburg appreciates fully the value of this project to the State of Colorado as an important step in the retention of its waters for the benefit of its own people and the special benefit to the Arkansas Valley in supplying sorely needed domestic and irrigation water and finally the indirect value to this city by reason of the enlargement of a closely located market for its products; and

Whereas this city believes the prompt development of all projects necessary to the beneficial use by the State of Colorado, of all the waters of the Colorado River allotted to it, is vital to the welfare of the entire county: Now, therefore, be it

*Resolved by the City Council of the City of Walsenburg, in regular session assembled on this 6th day of May 1953,* That said city council declare itself in favor of the Fryingpan-Arkansas project, of the diversion of water by means of said project, and of the construction of the tunnel, canals, and other means for the diversion of water as provided in the said project; and be it further

*Resolved,* That this resolution be spread upon the minutes of this meeting; that the original be sent to the executive secretary-treasurer of the Southeastern Colorado Water Development Association, and that copies thereof be sent to all members of the Colorado delegation for the purpose of acquainting them with the desires of the people of Walsenburg, in this connection, and to respectfully request their favorable action on this matter when presented to Congress in the near future.

STATE OF COLORADO,
*County of Huerfano, City of Walsenburg, ss.*

I, Thomas M. Wilson, the duly elected, qualified and acting city clerk of the city of Walsenburg, Colo., do hereby certify that the above and foregoing annexed resolution is a true, perfect, and complete copy of a certain resolution passed and adopted at a regular meeting of the City Council of the City of Walsenburg, Colo., which meeting was held on Wednesday the 6th day of May A. D. 1953, as appears from the records and files in my office remaining.

In testimony whereof I have hereunto set my hand and affixed the seal of the said city of Walsenburg on the 6th day of May A. D. 1953.

THOMAS M. WILSON, *City Clerk.*

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RESOLUTION OF THE CITY OF PONCHA SPRINGS, COLO., ADOPTED THIS 19TH DAY OF MAY 1953

*To the Honorable Members of the House of Representatives and the Senate of the Congress of the United States of America:*

Whereas the members of the city of Poncha Springs, Colo., do by this resolution heartily endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas, by making available more water for irrigation in these States, and more power to operate industries, businesses and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to the sections where adequate water and power is available, and the resultant water and power from this project will be sufficient to accomodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business, all of which can be derived from the increased water and power from this project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas project is too great to be defrayed by State or private interests: Now, therefore, be it

*Resolved by the city of Poncha Springs, Colo.*, That the accomplishment of this diversion project is in the best interest of our Nation, and the city of Poncha Springs, Colo., does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

TED HOLMAN, *Mayor.*

Attest:

GERTRUDE GLENN, *City Clerk.*

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RESOLUTION—CITY OF LAS ANIMAS

1. Whereas the Bureau of Reclamation of the Federal Government is planning for the development of new supplies of water for the eastern slope of Colorado known as the Fryingpan-Arkansas transmountain diversion; and

2. Whereas the domestic water supply of the city of Las Animas is unsatisfactory by reason of being very hard and carrying considerable alkali and such project would make available for domestic use a more suitable quality of water; and

3. Whereas there are large amounts of land within the trade territory of the city of Las Animas which might be improved by irrigation; and

4. Whereas supplemental supplies for existing irrigation projects would be supplied by said project and the agricultural economy of our community would be stablized; and

5. Whereas the return flows from the waters supplied to the lands upstream from this area would all operate to the benefit of the people, the farms, the farmers, and the businessmen residing within Las Animas and its trade territory: Now, therefore, be it

*Resolved by the City Council of the City of Las Animas*, That they do express their approval of the endorsement of said project and they urge the passage of necessary legislation and the appropriation of the funds required for said project; and be it further

*Resolved*, That copies of this resolution be furnished the Bureau of Reclamation, the various water-development associations and Colorado's congressional delegation and such other agencies as may have to do with this project.

Adopted and approved this 7th day of April 1952.

E. A. THAXTON, *Mayor.*

Attest:

DAN MCAFEE.

STATE OF COLORADO,
*County of Bent, City of Las Animas, ss:*

I, Dan McAfee, city clerk of the city of Las Animas, Colo., certify the above and foregoing to be a full, complete, and correct copy of a resolution adopted at a regular meeting of the City Council of the City of Las Animas, Colo., by said city council on April 7, 1952.

DAN MCAFEE, *City Clerk.*

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EXCERPT OF MINUTES OF A RECESSED MEETING OF THE CITY COUNCIL HELD ON MAY 21, 1953, ALL MEMBERS BEING PRESENT

"Alderman Fabrizio offered the following resolution:

"Whereas there is a shortage of water for municipal purposes, for irrigation and future industrial expansion in this area; and,

"Whereas it is deemed desirable to supplement our present water supply: Now, therefore, be it

"*Resolved*, That this council, individually and on behalf of the citizens of the city of Florence, Colo., go on record as heartily endorsing the Fryingpan-Arkansas water project and to recommend to the Federal Government that the Fryingpan-

Arkansas water project be approved according to the present plans and specifications.

"Upon motion by Tripp, seconded by Cristelli, the foregoing resolution was unanimously adopted by the council."

Dulcie D. Moore, duly appointed and acting city clerk of the city of Florence, Colo., does hereby certify that the above excerpt of minutes is a true, correct, and complete copy of a portion of the minutes of the City Council of the City of Florence, Colo., at a recessed meeting held on the 21st day of May, A. D. 1953. All members present.

Witness my hand and the seal of said city this 21st day of May, A. D. 1953.

DULCIE D. MOORE, *City Clerk.*

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RESOLUTION—CITY OF CANON CITY

Whereas Colorado is richly endowed with natural resources as fertile land and an abundance of mineral wealth beneath the soil; and

Whereas the population of Colorado is increasing at a phenomenal rate; and

Whereas the continued development of the aforementioned resources, and welfare of the mass population are dependent upon the key resource—water; and

Whereas there is now before the Congress of the United States a bill to construct the Fryingpan-Arkansas project, which said project will develop, conserve, and make available for consumptive use an amount of water now absolutely necessary and positively needed in the Valley of the Arkansas River: Now, therefore, be it

*Resolved,* That the Canon City Council in meeting duly assembled does hereby respectfully urge the Colorado congressional delegation to take all action proper and necessary to secure congressional authorization of the Fryingpan-Arkansas project.

A. R. REEVES, *Mayor.*

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RESOLUTION—TOWN OF MANZANOLA

Trustee Harold Swift presented the following resolution and moved the adoption thereof:

Whereas the town of Manzanola owns and operates its own municipal water system which is maintained for the purpose of supplying domestic water and fire protection for the citizens of said town; and

Whereas the water supply of the town of Manzanola is limited from its present wells: Now, therefore, be it

*Resolved and it is hereby resolved by the Board of Trustees of the Town of Manzanola,* That the proposed plan by the Water Development Association of Southeastern Colorado for transmountain water diversion from the western slope of the mountains of Colorado to the Arkansas River for domestic and other purposes would be of great benefit to the town of Manzanola, by insuring the citizens of the town of Manzanola of sufficient water for domestic uses and fire protection; and be it further

*Resolved,* That the trustees of the town of Manzanola are in favor of transmountain water diversion.

Thereupon, Trustee T. A. Davis, Jr., seconded the motion to adopt said resolution, and the question of the adoption of said motion and said resolution was put to the board of trustees by the mayor and the roll was called with the following results:

Those voting "aye": Harold Swift, T. A. Davis, Jr., Russell Boley, and Claude J. Bolin.

Those voting "nay": None.

Absent: L. J. Mikow and Charles E. Bauer.

All members present of the board of trustees having voted in favor of said motion and said resolution, the mayor thereupon declared the motion and the resolution unanimously adopted.

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RESOLUTION—INCORPORATED TOWN OF SWINK

Be it hereby resolved by the Town Council, Incorporated Town of Swink, Otero County, Colo.:

Whereas the growth of the town of Swink has been held static by the very limited domestic water supply available; and

Whereas attempts to increase this supply by the drilling of additional wells have failed; and

Whereas plans for additional housing which is needed to take care of workers in the local Holly Sugar Co. factory and other industry cannot be made because of lack of water supply: Now, therefore, be it

*Resolved*, That the town of Swink endorses the proposed Gunnison-Arkansas water diversion project, and petitions the Congress to immediately take steps to authorize the same, and that a copy of this resolution be forwarded to our Senators and Representatives in Congress.

Done at Swink, Colo., this 26th day of March, 1952.

G. E. KIMBLE, *Mayor.*

Attest:

HAZEL KIMBLE, *Town Clerk.*

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RESOLUTION—CITY OF FOWLER, COLO.

OFFICE OF THE CITY COUNCIL,
*Fowler, Colo., March 28, 1952.*

*To All to Whom These Presents May Come, and Particular to: The Congress of the United States, the Reclamation Department of the United States, the State of Colorado, the Colorado State Water Board, the Fryingpan-Arkansas Association, and to Any and All Interested Parties, Greetings:*

*Be it resolved, and it is hereby resolved*, That our valley and our cities are in a state of emergency; that our greatest requirement and most urgent need is more water; that detailed explanation of localized water problems are secondary to the main issue; that the Fryingpan-Arkansas is the only immediately visible answer to these several water problems.

We therefore request, of all interested parties, or agencies of practicable application, that all efforts be put forth to expedite the construction of the Fryingpan-Arkansas project.

Sincerely,

COUNCIL OF THE CITY OF FOWLER, COLO.,
A. A. KEELING, *Mayor.*
CHARLES HECKART,
CURTIS L. MILLER,
MURRELL H. SCHERRER,
CLIFFORD A. ROWE,
S. D. CLARK,
MARSHALL B. BARNARD,
*Councilmen.*

Attest:

JOE M. RILEY, *City Clerk.*

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RESOLUTION BY THE TOWN OF BUENA VISTA, ADOPTED THIS 20TH DAY OF MAY 1953

*To Honorable Members of the House of Representatives and the Senate of the Congress of the United States of America:*

Whereas the members of the board of trustees of the town of Buena Vista do by this resolution endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas by making available more water and power to operate industries, businesses and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to sections where an adequate supply of water and power is available, and the resultant water and power from this project will be sufficient to accommodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output and better business, all of which can be derived from the increased water and power from this project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas River project is too great to be defrayed by State or private interests: And now, therefore, be it

*Resolved by the Board of the town of Buena Vista*, That the accomplishment of this diversion project is in the best interest of our Nation and the town of Buena

Vista does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

RAY SLAW,
*Mayor Pro Tem.*

Attest:

HELEN M. STEVENS, *Clerk.*

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RESOLUTION FAVORING THE CONSTRUCTION OF THE FRYINGPAN-ARKANSAS WATER PROJECT

*Be it resolved*, That the city council of the city of La Junta, State of Colorado hereby specifically approves of the Fryingpan-Arkansas water development. We feel that it is necessary for the future development of the city of La Junta and that it is the main key to the economic life of our community; be it further

*Resolved*, That the city of La Junta hereby subscribes to all the benefits that may be made available to the communities included within this Fryingpay-Arkansas project.

THOMAS F. POUND, *Mayor.*

Attest:

HAZEL BEST GIRCH, *City Clerk.*

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RESOLUTION—CITY OF ROCKY FORD

Whereas the city of Rocky Ford, Colo., is one of the municipalities proposed to be served with domestic water under the existing plans for the Gunnison-Arkansas diversion project now proposed; and

Whereas due to the arid nature of this locality and the variable quality of existing water supplies for domestic and industrial use, it is of great importance to the inhabitants not only of this city, but of its environs and of other communities in this area that a dependable supplemental source of good quality water be obtained: Therefore be it

*Resolved by the City Council of the City of Rocky Ford, Colo.*, That the Congress of the United States be most strongly urged to authorize and provide means for the construction of the Gunnison-Arkansas diversion project.

C. EARL HOLLAND, *Mayor.*

I, Clyde F. Summers, city clerk, of the city of Rocky Ford, Colo., a municipal corporation existing under and by virtue of the laws of the State of Colorado, do certify that the above is a full, true and complete copy of a resolution passed by the city council of the city of Rocky Ford, Colo., at a regular meeting held Tuesday, March 18, 1952.

In witness whereof, I have hereunto set my hand and seal of the city of Rocky Ford, Colo., this ——th day of March A. D. 1952.

Attest:

[SEAL] CLYDE F. SUMMERS, *City Clerk.*

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MAY 7, 1953.

Hon. EUGENE C. MILLIKIN,
*United States Senator, Washington, D. C.*

DEAR SIR: The Eads Chamber of Commerce takes this opportunity to endorse the Fryingpan diversion project and urge that you lend your influence to bring this project to a speedy and successful conclusion.

We, in the plains area of eastern Colorado, feel that the project will be of great value since it will furnish us with favorable supply of domestic water, of which we have a very limited amount.

We urgently urge your support on this project and remain,

Sincerely,

LEVI RUTLEDGE,
*Eads Chamber of Commerce.*

RESOLUTION OF THE CHAFFEE COUNTY COMMISSIONERS ADOPTED THIS 19TH DAY OF MAY 1953

*To the Honorable Members of the House of Representatives, and the Senate of the Congress of the United States of America:*

Whereas the members of the Board of County Commissioners of Chaffee County, Colo., do by this resolution heartily endorse the Fryingpan-Arkansas River project; and

Whereas the benefits derived from the water and power from this project will be of material benefit to thousands of people in Colorado, Kansas, Oklahoma, and Arkansas, by making available more water for irrigation in these States, and more power to operate industries, businesses, and farms in these States; and

Whereas in the event of a national emergency many war industries and allied plants will move to the sections where adequate water and power is available, and the resultant water and power from this project will be sufficient to accommodate such industries; and

Whereas the economy and stability of our Nation can be greatly enhanced through increased farm production, industrial output, and better business, all of which can be derived from the increased water and power from this project; and

Whereas the overall cost of construction of the Fryingpan-Arkansas project is too great to be defrayed by State or private interests: Now therefore be it

*Resolved by the Board of County Commissioners of Chaffee County, Colo.*, That the accomplishment of this diversion project is in the best interest of our Nation, and the Board of Commissioners of Chaffee County, Colo., does urge that our Representatives and Senators in the Congress of the United States give earnest consideration in the immediate passage of the Fryingpan-Arkansas River diversion bill.

JAMES R. SHEEHAN, *Chairman.*

Attest:

JOSEPH T. MCDONOUGH, *County Clerk.*

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STEEL CITY INVESTMENT CO.,
*Pueblo, Colo., June 19, 1953.*

Mr. E. K. NELSON,
*Senate Committee on Interior and Insular Affairs,*
*Washington, D. C.*

DEAR MR. NELSON: I failed to turn over the enclosed resolution to you at the time of the Senate committee hearings June 15 and 16 on our proposed Fryingpan-Arkansas project.

Thank you.

Sincerely yours,

D. P. DUCY,
*President, Water Development Association of Southeastern Colorado.*

RESOLUTION—CITY OF LEADVILLE, LAKE COUNTY, COLO., JUNE 1, 1953

Whereas the city council of the city of Leadville, Colo., recognizes the extreme need for additional water supply for the further development and industrial growth of the Pueblo, Colo., area; and

Whereas the city council also recognizes the need for additional municipal water as well as irrigation water in the Arkansas Valley of Colorado; and

Whereas the city council further realizes a very definite need for economical electric power to bring further development to the mining and smelting industry in the Leadville mining district: Be it

*Resolved*, That the city council of the city of Leadville, Colo., does hereby respectfully urge the Congress of the United States to approve the Fryingpan-Arkansas project at the earliest possible date, for the reasons outlined in this resolution.

(Signed) WALTER F. O'BRIEN, *Mayor.*
FLOYD MORRIS, *Councilman.*
LLOYD L. EVANS, *Councilman.*
VERNON BISHOP, *Councilman.*
W. B. KEATING, *Councilman.*
AMIL DAMYAMOVICH, *Councilman.*
MICHAEL DONOVAN, *Councilman.*

IZAAK WALTON LEAGUE OF AMERICA, INC.,
COLORADO DIVISION,
*Littleton, Colo., June 25, 1953*

Hon. HUGH BUTLER,
*Chairman, House Interior and Insular Affairs,*
*Senate Chambers, Washington, D. C.*

DEAR MR. BUTLER: Enclosed you will find a copy of a resolution adopted by the Colorado division of the Izaak Walton League of America at its annual convention, held at Rifle, Colo., June 19, 20, 21, 1953, in regard to the Fryingpan-Arkansas diversion project.

Therefore we ask your opposition to the authorization of this project.

Sincerely yours,

EDNA H. HILL,
*Secretary, Colorado Division, IWLA.*

The Colorado division, Izaak Walton League of America, at its 28th annual convention, held at Rifle, Colo., June 19, 20, 21, 1953, goes on record as being opposed to authorization of the Fryingpan-Arkansas diversion project until such time as it can be clearly demonstrated that such diversion will not threaten the future welfare and development of Colorado's western slope, and until such time as project plans incorporate adequate protection of fish, wildlife, and recreational values in the Arkansas Valley as well as on the western slope, and until the project shows itself to be economically feasible by adequate standards of evaluation of all resources affected.

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DENVER, COLO., *June 16, 1953.*

Senator EUGENE D. MILLIKIN,
*Interior and Insular Affairs Committee,*
*United States Senate, Washington, D. C.:*

Our considered opinion is the proposed Fryingpan-Arkansas diversion project should not be authorized without further study and analysis in terms of western slope water requirements. Mitigation of heavy fish and wildlife losses in the Arkansas Valley, ratio of cost to water delivered, and other factors.

J. W. PENFOLD,
*Western Representative, Izaak Walton League.*

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PUEBLO, COLO., *June 18, 1953.*

Hon. EUGENE D. MILLIKIN,
*Senate Office Building, Washington, D. C.:*

Please inform Senate Interior and Insular Affairs Committee in connection with the current hearings on the Fryingpan-Arkansas project that the city of Pueblo must procure additional sources of water to survive. All sources of water east of the Continental Divide have been exhausted and required additional supply must come for Colorado River tributaries. Pueblo currently contemplates substantial additional capital improvements in connection with its south side distribution systems. We realize the costs per acre-foot are high but water is worth just what it costs. We are willing to negotiate for additional supplies from the Fryingpan-Arkansas project. We will appreciate your efforts to assist us.

W. H. COOZE,
*Chairman of the Board, District No. 1.*

ED MCCABE,
*Chairman of the Board, District No. 2.*

Senator MILLIKIN. I will also place in the record at this point a letter addressed to me from Mr. Harold H. Christy regarding this project.

(The letter referred to follows:)

WASHINGTON, D. C., *June 16, 1953.*

Hon. E. D. MILLIKIN,
*Chairman, Committee on Irrigation and Reclamation,*
*Senate Office Building, Washington, D. C.*

DEAR SENATOR: The statement was made by witnesses before your committee to the effect that Colorado Springs could be benefited from the project by means of exchange of waters to the extent of 4,000 acre-feet.

The city of Colorado Springs presently has reservoirs located on the headwaters of Beaver and Middle Beaver Creeks, which flow southward and drain into the Arkansas River west of Pueblo. This reservoir system is connected with reservoirs on the north slope of Pikes Peak which drain into the headwaters of the Fountain River, which is a tributary of the Arkansas River, the junction being at Pueblo.

The waters from the tributaries on the south slope of Pikes Peak, namely Beaver and Middle Beaver Creeks, can be delivered to the city's existing system by a low pump lift, and thus transmitted by this system through existing hydroelectric plants owned by the Municipal Corp. of Colorado Springs. The elevation of the outlet of the hydroelectric turbines is sufficient to deliver water to the city of Colorado Springs under pressure.

The exchange from the Fryingpan-Arkansas project can be effected with project water to the senior appropriators in the lower regions of the Beaver Creek drainage, thus compensating them for the new or additional water taken at the higher elevations on this drainage into the municipal system by the aforementioned pump lift.

Power produced through such an exchange of water in the municipal hydroelectric plant of Colorado Springs is in excess of the energy required to lift the water from the Beaver Creek drainage on the south slope into the reservoirs of the municipal system.

There is presently in existence a powerline permitting exchanges between the municipal plant at Colorado Springs and the Southern Colorado Power Co., the owners of the Skaguay hydroelectric plant on the headwaters of Beaver Creek. This will permit exchanges of power to compensate for losses of power at the Skaguay plant which is due to reduced flows because of the pump lift into the municipal system.

Respectfully yours,

HAROLD H. CHRISTY.

Mr. DUCY. Senator, in winding up, we cannot thank you too highly for your extreme courtesy in getting your committee members to sit on such short notice, and saving us an extra trip. You probably will be darned glad to get us out of your hair so you can go back to work. We, much as we like you, will be awfully glad to get back to Colorado tomorrow.

We thank you.

Senator MILLIKIN. I can tell you sincerely it is a great pleasure to preside over a hearing of this kind. You gentlemen have made a magnificent case, in my opinion.

Mr. DUCY. Thank you, sir.

Senator MILLIKIN. Anything else?

I should add, before we close our hearings on this matter, that if you gentlemen have anything else, on further reflection on the hearing here, that you want us to consider, send it in and it will be considered, but get it here as promptly as possible.

Mr. DUCY. Thank you, sir.

Senator MILLIKIN. Thank you very much, folks.

(Whereupon, at 5:45 p. m., the hearing was closed.)

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